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## USSR; LIFE SCIENCES

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UDC 612.766.2-08:612.751.1.014.46:[615.357.631.017:615.272.6+615.357.441:  
557.175.446

EFFECTS OF CALCITONIN AND RETABOLIL ON RAT FEMUR IN HYPOKINESIA

Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA in Russian  
No 4, Jul-Aug 86 (manuscript received 15 Mar 85) pp 53-56

[Article by I.V. Rogacheva, Moscow]

[Abstract] Therapeutic trials were conducted with calcitonin and Retabolil (nandrolone decanoate) in the case of femoral osteoporosis induced by immobilization in Wistar rats (180-200 g). Immobilization consisted of support elimination by tibial amputation. In the control animals immobilization led to diminished femoral growth, thinning of cortical layers, and frank osteoporosis. Animals treated with either calcitonin (2 U MRC, s.c, every other day) or Retabolil (0.2 ml, once every 10 days) for 40 days did not present with any evidence of improvement in terms of underlying femoral changes. However, administration of a combination of calcitonin + Retabolil prevented further atrophy of the femur. The effectiveness of the combined therapy was attributed to prevention of bone protein catabolism by Retabolil and of mineral loss, by calcitonin. Figures 1; tables 1; references: 7 Russian.

12172/9835  
CSO: 1840/786

UDC 595.792:591.522

ECESIS OF ENTOMOPHAGES WITH THEIR HOSTS INTO NEW ZOOGEOGRAPHICAL REGIONS

Leningrad ENTOMOLOGICHESKOYE OBOZRENIYE in Russian Vol 66, No 10,  
Jan-Mar 87 (manuscript received 20 Nov 83) pp 26-31

[Article by V.A. Tryapitsyn and Ye.S. Sugonayev, Zoological Institute,  
USSR Academy of Sciences, Leningrad]

[Abstract] In 1971 DeBach coined the phrase "ecesis" to designate humanly uncontrollable penetration of entomophages along with their hosts or victims beyond the reaches of the original infested areas. Due to this process, entomophages achieve a total or at least partial biological suppression of various pests. It was shown by numerous citations that ecesis is a widespread phenomenon leading to biological suppression of pests in large geographical regions. Studies of ecesis should yield important theoretical and practical findings in biological control of agricultural pests. It could also represent introduction of enemies of desirable economically-important species and therefore must be considered in quarantine measures to be undertaken. Numerous examples of ecesis are cited. Figures 2; references 14: 10 Russian (1 by Western authors), 4 Western.

7813/9835  
CSO: 1840/819

UDC 576.311.3

ULTRASTRUCTURAL CHANGES IN TUBER CELLS OF SOLANUM TUBEROSUM (SOLANACEAE)  
UNDER INFLUENCE OF PROTECTIVE REACTIONS INDUCER ISOLATED FROM PHYTOPHTOROSIS  
AGENT

Leningrad BOTANICHESKIY ZHURNAL in Russian Vol 71, No 10, Oct 86  
(manuscript received 17 Jul 85) pp 1375-1382

[Article by T.A. Platonova, G.V. Akenshina and O.L. Ozeretskovskaya,  
Institute of Biochemistry, USSR Academy of Sciences, Moscow]

[Abstract] A biogenic inducer lipoglycoproteid complex (LGP) of protective reactions in potatoes was isolated in the Laboratory of Plant Immunity,



Institute of Biochemistry imeni A.N. Bakh, USSR Academy of Sciences from the mycelium of phytophthora agent. Its mechanism of action remains unknown; therefore its effect on the ultrastructure of growing cell of potato parenchyma was investigated by concurrent biochemical, phytopathological and EM methods. It was shown that sensitization of potato tuber cells with even small doses of LGP resulted in conversion of the cells into an active state resulting in their ability to resist infections rapidly and effectively. This sensitization is related to functional tuber cell rearrangement from storage of plastic substances to increase of their biosynthetic potential. Most of all, the synthesis of specialized protective agents is intensified (terpenoid phytoalexines, possibly phenolic compounds and suberine, participating in formation of mechanistic barriers on the route of infection). References 35: 16 Russian, 19 Western.

7813/9835

CSO: 1840/823

UDC 633.16"321":632.931

#### FRIT-FLY DAMAGE TO SPRING BARLEY AS FUNCTION OF PLANTING ARCHITECTONICS

Moscow DOKLADY VSESOYUZHNOY ORDENA LENINA I ORDENA TRUDOVOGO KRASNOGO ZNAMENI AKADEMII SELSKOKHOZYAYSTVENNYKH NAUK IMENI V.I. LENINA in Russian No 6, Jun 86 (manuscript received 4 Oct 85) pp 44-45

[Article by N.A. Ryabchenko, Donetsk Oblast State Agricultural Experimental Station]

[Abstract] The effect of planting architectonics on the damage to Donetsk spring barley by the frit-fly was studied in the 1980-1985 period at the State Experimental Agricultural Station of the Donetsk Oblast. The optimal planting density under the existing conditions was 4.5-5 million seeds per hectare; this lowered the damage by the frit-fly about 2-2.5 fold in comparison to a less-dense planting. Field germination was also a very important factor, depending on moisture reserves in the upper 10 cm of the soil. When the density of planting increased to 6-7 million per hectare, the harvest yield dropped. At the optimal planting density, the economical effectiveness was 23.7 rubles per hectare; with the 7 million seeds per hectare it dropped down to 15.8 rubles. Figures 1; references 10: 9 Russian, 1 Western.

7813/9835

CSO: 1840/1077

REACTION OF WHEAT GROWN FROM DIFFERENT SEEDS TO VARIOUS SOIL CONCENTRATIONS OF TORDONE 22K

Moscow IZVESTIYA TIMIRYAZEVSКОЙ SELSKOKHOZYAYSTVENNOY AKADEMII in Russian No 4, Apr 86 (manuscript received 23 Dec 85) pp 115-121

[Article by V.P. Mukhin and Yu.Ya. Spiridonov, Department of Applied Nuclear Physics and Radiochemistry]

[Abstract] Sensitivity of wheat to Tordone 22K was studied as a function of parent seed mass. Experiments were carried out in green houses using super elite seeds of spring wheat Moskovskaya 35. The seeds varied considerably with respect to their size. Even with low concentration of Tordone, significant differences were noted in the depression of productivity. With increased content of Tordone this effect was manifested even stronger. Individual wheat fractions varied as much as 2-4 fold in their sensitivity to Tordone. The seeds with greater weight (per 1,000 seeds) showed greater resistance to Tordone than those with lower weight: at ED<sub>50</sub> this amounted to 25% and at ED<sub>90</sub> to 30-60%. References 36: 34 Russian, 2 Western.

7813/9835  
CSO: 1840/1123

UDC 582.28

RUST FUNGI OF CEREAL GRASSES IN ALMA-ATA OBLAST

Alma-Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR. SERIYA BIOLOGICHESKAYA in Russian No 6, Nov-Dec 86 pp 20-23

[Article by S.A. Abiyev, B.K. Baymatayeva, A.K. Rakhimbekova, I.M. Shaymardanov, K.D. Rysbayeva, B.Zh. Yesengulova and G.N. Kenesarina, Institute of Botany, KaSSR Academy of Sciences]

[Abstract] Cereal grasses of the Alma-Ata Oblast were examined in 1979 and 1984 for rust infections. Most of them were infected with brown rust (*Puccinia persistens* Plowr) in all zones of the Oblast. Stem rust (*P. graminis* Persis.) damaging wild rye and couch grass; it is spread in the low mountainous region and in the valleys. Crown rust (*P. coronata* Cda.) was found on couch grasses, wild rye and brome grass in steppes approaching the mountains. Yellow rust attacked wheat and dew grass principally in low and middle mountainous zones. The other types (in all 14 were registered) were found in limited amounts. References: 3 Russian.

7813/9835  
CSO: 1840/762

## PROCUREMENT OF NEW PLANT VARIETIES

Moscow VESTNIK AGROPROMA in Russian No 15, 10 Apr 87 p 5

[Article by I. Selivanov, correspondent]

[Abstract] This article reports an interview with Doctor of Biological Sciences I.M. Surikov head of the laboratory of Cellular Engineering and Tissue Culture, All-Union Scientific Research Institute of Plant Husbandry imeni N.I. Vavilov. That laboratory is examining new methods of long range hybridization and possibilities of cellular constructions of various agricultural varieties to increase their resistance to pests and climatic conditions. Even though the laboratory is not yet 4 years old, hybrid tomato seeds have already been developed and submitted to the Crimea Experimental Station for field studies. The new plant is more resistant to diseases and pests and contains much higher levels of provitamin A. Work is under way also to create wheat-barley hybrids. Some success has already been achieved although no seeds were produced so far by the hybrid plants. Work is limited to rather basic research creating new sorts by transplanting various chromosomes into hybrid cells; the selection of final products must be done by organizations best suited for this purpose. Cellular engineering is felt to be an important link in overall intensive agricultural technology but it is just a part of a bigger whole where different tasks are targeted for different specialties.

7813/9835

CSO: 1840/706

UDC 581.142:581.192.7

## EFFECT OF FUSICOCCIN ON DEEP-DORMANT SEED GERMINATION

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 293, No 2, Mar 87  
(manuscript received 17 Sep 86) pp 510-512

[Article by T.V. Daletskaya and M.G. Nikolayeva, Botanical Institute imeni V.L. Komarov, USSR Academy of Sciences, Leningrad]

[Abstract] Fusicoccin (FK) was first isolated from a culture liquid of the parasitic fungus *Fusicoccum amygdal* and it was found to have potent stimulating properties which are similar to those of commonly known phytohormones. A study of the effect of FK on Tatar maple seeds, known for their deep dormancy so that the seeds do not germinate at 10°C and above is described. Treatment of embryos from dormant Tatar maple seeds by 5-50 mg/l of FK produced mass normal germination in a period of 4-14 days, in the dark at 19-20°C and greatly accelerated disruption of dormancy at 0-3°C. An FK solution of 1 or 5 mg/l (100-500 times less than the effective concentration of kinetin) almost doubled germination of 60 percent of the seeds. FK not only disrupted shallow germination of seeds but also disrupted deep physiological dormancy during cold stratification and ensured germination at 10°C. While kinetin is most

effective at 10°C, FK is effective at 0-3°C without cold stratification. FK, in contrast to kinetin, ensures completely normal germination of dormant embryos and seeds and is a phytohormone. Figures 1; references 9: 5 Russian, 4 Western.

2791/9835  
CSO: 1840/606

UDC 633:511.631.8

DORANIN: COTTON GROWTH STIMULATOR

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 5, Sep-Oct 86  
(manuscript received 6 Oct 85) pp 58-59

[Article by A.U. Kariyev, G.A. Stepanenko, A.A. Umarov and A.I. Glushenkova,  
Institute of Plant Substance Chemistry, Uzbek SSR Academy of Sciences]

[Abstract] This article represents a search for an effective preparation to stimulate growth and development of cotton. It has been found that various salts of the indole alkaloid donaxin are biologically active and accelerate the development of plants. Synthetic doranin, a white substance, moderately toxic for homiotherms, nonphytotoxic, was used in field studies on type S-4880 cotton in depleted serozem with deep water table, low humus and nutrient content. Changes were noted in leaf surface area, content of green pigment and intensity of photosynthesis, each plant increasing in leaf surface by 150 cm<sup>2</sup>, with an increase in green leaf pigment and CO<sub>2</sub> absorption rate. Doranin was also found to facilitate movement of soluble sugars in the plant, increasing cotton yield. The harvest was increased by 3.3 hwt/ha by application of doranin. Figures 1; references: 3 Russian.

6508/9835  
CSO: 1840/681

# INDUCTION OF CYTOKININ ACTIVITY IN AMARANTHUS CAUDATUS PLANTS, TREATED BY HUMAN INTERFERON AND 2'-5'-OLIGOADENYLATES

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 293, No 1, Mar 87  
(manuscript received 24 Dec 86) pp 253-256

[Article by M.E. Talyanskiy, S.I. Malyshenko, I.B. Kaplan, V.N. Lozhnikova, N.D. Dudko, M.Ya. Karpeyskiy, S.N. Mikhaylov, N.Sh. Padyukova, V.I. Ogarkov, I.G. Atabekov, full member of All-Union Academy of Agricultural Sciences imeni V.I. Lenin and M.Kh. Chaypakhin, academician]

[Abstract] The capacity of human interferon (INF) and 2'-5'-oligoadenylates (2-5A) to induce cytokinin activity in *A. caudatus* L. plant tissue by use of a recombinant human INF- $\alpha$  2 preparation, produced by *E. coli* cells, is described and discussed. Cytokinin activity was determined by inducement of betacyanin synthesis in the dark by cytokinin in the presence of tyrosine, used as a substrate. Experiments with *A. caudatus* sprouts showed that INF  $\alpha$  2 produced pronounced cytokinin activity at concentrations beginning as low as 0.1 unit/ml which corresponds to 0.005  $\mu$ g/l for the preparation used. Maximum effect of INF- $\alpha$  2 appeared at concentration of 0.1 unit/ml but increase of concentration reduced cytokinin activity. In control experiments, induction of cytokinin activity was almost completely blocked by monoclonal antibodies to INF. In another control experiment, interleukin obtained from *E. coli* cells had practically no effect on betacyanin formation in *A. caudatus* sprouts. The results indicated the specificity of induction of cytokinin activity by 2-5A-type oligonucleotides. References 14: 5 Russian, 9 Western.

2791/9835

CSO: 1840/577

# SPREAD OF HERBICIDES WITH IRRIGATION WATER ON PRINCIPAL AGRICULTURAL CROPS

Moscow VESTNIK SELSKOKHOZYAYSTVENNYKH NAUK in Russian No 8, Aug 86  
(manuscript received 8 Aug 85) pp 86-91

[Article by A.V. Beshanov and V.I. Ivashkin, All Union Order of the Labor Red Banner Scientific Research Institute of Plant Protection and All Union Scientific Production Association "Raduga"]

[Abstract] Spread of herbicides (herbigation) with irrigation water is strongly advocated as a labor saving innovation. A number of herbicides specifically suited for this method are noted as are applications on individual crops. Powder herbicides are somewhat limited in this respect as they require constant agitation. Practically all methods of irrigation can be used: rain

machines, drop systems, flooding, under-surface irrigation and furrow-delivered water. Overall herbigation is efficient, does not waste herbicides and is applicable on large scale. References 8: 6 Russian (1 by Western authors), 2 Western.

7813/9835  
CSO: 1840/1080

UDC 621.039 + 63

#### ATOMIC ENERGY AND AGROINDUSTRIAL COMPLEX

Moscow VESTNIK SELSKOKHOZYAYSTVENNOY NAUKI in Russian No 6, Jun 86 pp 158-159

[Article by V.V. Rachinskiy]

[Abstract] This is a review of the book "Radioecology of Irrigational Soil Cultivation". Edited by A.M. Aleksakhin, it is a multiple author effort. The subject concerns utilization of warm effluent from nuclear power plants in agriculture. In the introduction by the author, radioecology of irrigated soil cultivation was discussed, claiming that relatively minimal radiocontamination of the environment results from such effluents. The first three chapters cover material on development of nuclear technology, use of water in this energy-producing cycle, migration of radionuclides in the soil-vegetation cycle etc. It is claimed that no special system of soil cultivation is required. The fourth chapter deals with the most irrigated culture--rice growing. Mathematical modelling of radionuclide migration is treated next which, the reviewer felt had really no place in this book, being too technical. The sixth chapter covering radiation hygiene, regulatory measures and safety is also adversely criticized for inadequate coverage of the subject. The last chapter is devoted to pseculation on future potential of the use of nuclear-power-plant effluents to provide a heat source for irrigated soil cultivation. The book does not get top marks from the reviewer but is lauded for attempting to cover a novel subject matter.

7813/9835  
CSO: 1840/1081

UDC 577.112:543.422.25

## ESTABLISHMENT OF SPATIAL STRUCTURE OF APAMINE IN SOLUTION. CONFORMATIONAL ANALYSIS ACCORDING TO DATA FROM TWO-DIMENSIONAL NUCLEAR OVERHAUSER ENHANCEMENT SPECTROSCOPY

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 293, No 2, Mar 87  
(manuscript received 14 Jul 86) pp 472-476

[Article by S.A. Sherman, A.M. Andrianov and A.A. Akhrem, academician,  
BSSR Academy of Sciences]

[Abstract] The peptide toxin, apamine, isolated from *Apis mellifera* honey bee venom, affects the central nervous system, specifically blocking nerve excitation transmission in smooth muscle and depressing non-adrenergic inhibiting potentials of smooth muscle cells of mammal stomach. Two-dimensional nuclear Overhauser enhancement spectroscopy was used to describe the spatial structure of the apamine shell structure and analysis of it was presented. Conformation parameters obtained by this method agreed with existing experimental data obtained for the apamine molecule. Circular dichromism spectroscopy and laser combination scattering spectroscopy have shown the existence, in apamine, of sections of a right alpha-spiral and a beta-bend(s) and this was confirmed in this study. Values of angle  $\varphi$  found by this method agree with values determined by vicinal constants of spin-spin interaction of  $^3J_{H-N-C^\alpha-H}$  and  $^3J_{^{13}C-N-C^\alpha-H}$ . The calculated system of distances between O and H atoms

of the basic chain showed the possibility of hydrogen bond formation and explained the slow exchange of amide protons of Ala-5, Cys-11, Ala-12, Arg-13, Cys-15 and Gln-16 residues with the solvent. The low rate of proton exchange of the amide group of residue Leu-10 was attributed to formation of a hydrogen bond of this donor group with oxygen of the Thr-8 side radical hydroxyl. Figures 1; references 15: 8 Russian, 7 Western.

2791/9835

CSO: 1840/606

## ACTIVE ESTERS OF OLIGONUCLEOTIDES--NEW TYPE OF PHOSPHORYLATING AGENTS IN AQUEOUS MEDIUM

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 293, No 2, Mar 87  
(manuscript received 21 Jul 86) pp 477-481

[Article by M.G. Ivanovskaya, M.B. Gottikh, Z.A. Shabarova and M.A. Prokofyev, corresponding member, USSR Academy of Sciences]

[Abstract] A new class of active derivatives of oligonucleotides, phosphodiester with p-nitrophenol, alpha-hydroxynitrophenol (I), alpha-hydroxypyridine (II) and N-hydroxybenzotriazol (III), was synthesized on pentanucleotide d(pTCTAG) and their properties were discussed. Compound III was the most reactive of the new compounds. Comparison of the properties of III with those of widely-used phosphoimidazolides of oligonucleotides showed them to have greater reaction capacity than phosphoimidazolides but lesser reaction capacity than N-methylimidazolides. In contrast to N-methylimidazolides with a period of semi-hydrolysis in water of less than 10 minutes, III may be readily synthesized in an aqueous medium and isolated and stored without powerful nucleophiles. Compound III makes it possible to produce some derivatives which cannot be synthesized by other methods. The simplicity of production and the high reaction capacity of III justifies the recommendation of the use of them as key intermediate compounds during synthesis of a wide range of derivatives of oligonucleotides, including non-radioactively labelled DNA- and RNA-probes. References 10: 5 Russian, 5 Western.

2791/9835  
CSO: 1840/606

## ENZYMIC HYDROLYSIS OF CELLULOSE IN ELECTRIC FIELD

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 293, No 2, Mar 87  
(manuscript received 25 Jun 86) pp 481-484

[Article by A.P. Sinitsyn, T.B. Larionova, L.V. Yakovenko and I.V. Berezin, corresponding member USSR Academy of Sciences, Moscow State University imeni M.V. Lomonosov]

[Abstract] An experimental approach to the increase of surface concentration of adsorbed enzymes, in order to increase the efficiency of enzymic hydrolysis of cellulose, involved the use of electro-containment of small particles or molecules with a charge on the dielectric matrix. This approach is suitable because the substrate, cellulose, is a dielectric and the cellulose molecules have ionogenic groupings. The study used preparations of cellulose complexes of *Trichoderma koningii*, *T. viride*, *Aspergillus foetidus* and *Sporotrichum dimorphosporum*. Electro-containment of the enzymes increased their concentration on the cellulose and increased the rate of hydrolysis 3-5-fold, for



all samples in comparison with cellulose adsorption in the absence of an electric field. The peak rate of hydrolysis on the cellulose occurred upon formation of a mononuclear layer of adsorbed molecules of the enzyme on the cellulose surface. Maximum specific rate of cellulose hydrolysis corresponded to minimum electro-containment of the enzymes. Electro-containment of the enzymes on a cellulose substrate increased the quantity of enzymes adsorbed on the cellulose and increased the efficiency of hydrolysis of the cellulose. The effect of the electric field on the system studied was clearly the controlling factor in manipulation of the adsorption processes and in the change of the surface concentration of the adsorbed cellulases within limits required. Figures 1; references 10: 9 Russian, 1 Western.

2791/9835  
CSO: 1840/606

UDC 615.355:577.152.429].012.076

#### IN VITRO AND IN VIVO PROPERTIES OF NATIVE AND DEXTRAN-MODIFIED HYALURONIDASE

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 11, Nov 86 (manuscript received 30 Jan 86) pp 567-569

[Article by A.V. Maksimenko, O.Yu. Konovalova, V.R. Berdichevskiy, O.G. Arkhipova and V.P. Torchilin, Laboratory of Engineering Enzymology, Institute of Experimental Cardiology, All-Union Cardiological Scientific Center, USSR Academy of Medical Sciences, Moscow]

[Abstract] Hyaluronidase was covalently coupled to 40,000 D dextran, to give a 150,000 D complex. The conjugate retained 90-100% of the baseline enzymatic activity, and showed 1.3- to 1.5-fold greater heat stability than the native enzyme. Studies with I-125-labeled conjugates, injected intravenously to BALB/c mice, showed primary localization in the liver and the kidneys, with proportionally meaningful levels also localizing in the lungs. The latter findings suggest the putative utility of using hyaluronidase-aldehydedextran conjugates in the management of pulmonary conditions. The half-life of the native protein in the blood stream of the BALB/c mice was 20 min, and that of the conjugate 30 min. References 11: 6 Russian, 5 Western.

12172/9835  
CSO: 1840/734

## EFFECT OF PHOSPHOLIPID COMPOSITION OF LIPOSOMES ON RATE OF RELEASE OF SYMPATHOMIMETICS

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 32, No 3, May-Jun 86  
(manuscript received 10 Apr 85) pp 322-327

[Article by L.Ya. Sazonova and A.V. Dmitriyeva, Institute of Physiology  
imeni A.A. Bogomolets, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] In vivo and in vitro studies were conducted with various liposomes to determine factors affecting release of entrapped sympathomimetics. Dialysis studies demonstrated that incorporation of cholesterol to a 50% molar concentration in lecithin:cholesterol liposomes prolonged release of epinephrine, isopropylnorepinephrine, and phenylephrine. Studies with intravenous administration of the liposomes to cats and rats showed that inclusion of cholesterol prolonged the cardiovascular effects of the sympathomimetics, as well as incorporation of components imparting a negative surface charge to the liposomes (dicetyl phosphate, phosphatidylserine). With the latter type of liposomes the duration of action of epinephrine and isopropylnorepinephrine was prolonged to 20-25 min, and that of phenylephrine to 30-45 min. Figures 4; references 13: 7 Russian, 6 Western.

12172/9835  
CSO: 1840/781

UDC 612.741.3-087.2

HOLOGRAPHIC RECORDING OF DEFORMATION WAVES IN MUSCLE TISSUE

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,  
No 10, Oct 86 (manuscript received 15 Apr 86) pp 495-498

[Article by V.S. Sinyakov]

[Abstract] Waves were recorded by two methods: static and dynamic. The static method involved measuring the bending of the surface of the muscle as a function of static force acting on the muscle through a circular stamp. In the dynamic studies, a shear deformation wave was created, the profile of which was recorded by holographic interferometry. The interferograms revealed that at frequencies from 200 to 500 Hz the vibrator creates deformation waves which penetrate into the muscle tissue deeply enough to be used to study the muscle tissues, the skin having practically no influence on the interference picture. The method is suitable for investigation of the biomechanical properties of human muscles and, also, for determination and investigation of heterogeneities in any elastic-viscous material. Figures 3; references: 5 Russian.

6508/9835

CSO: 1840/733

UDC 576.8

BIOTECHNOLOGY IN ENVIRONMENTAL PROTECTION AGAINST XENOBIOTICS

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 6, Nov-Dec 86 (manuscript received 7 Apr 86) pp 805-813

[Article by G.K. Skryabin and L.A. Golovleva, Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino]

[Abstract] A brief review is presented of the current advances in the application of biotechnology to the elimination of xenobiotic pollution and contamination of soil. In particular, special attention is accorded to the plasmid-assisted molecular breeding experiments conducted in the West. This approach has been successfully utilized in engineering promising microbial species that have been shown effective in biodegradation of a variety of xenobiotics. The review concludes with biological methods of pest control, and the application of both the organisms and their products in such applications. Finally, caution is sounded that care must be exercised in order to avoid complications stemming from the potential environmental hazard that such microorganisms and products may themselves represent. Figures 3; references 25: 2 Russian, 23 Western.

12172/9835  
CSO: 1840/674

ACETYLATION OF 2-(AMINO-R-PROPIONYLAMIDO)-BENZOPHENONES BY POLYACRYLAMIDE GEL-IMMOBILIZED ACTINOMYCETES

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 6, Nov-Dec 86 (manuscript received 6 Apr 84) pp 862-867

[Article by T.I. Davidenko, N.P. Miliyenko, V.D. Kuznetsov and S.A. Andronati, Physicochemical Institute, Ukrainian SSR Academy of Sciences, Odessa]

[Abstract] To further expand the usefulness of *Actinomyces roseochromogenes* ATCC 3360 in the preparation of optically-active benzophenone derivatives, enzymatic and immobilization experiments were performed for potential commercial application. *A. roseochromogenes* ATCC 3360 was shown to transform 2-(amino-R-propionylamido)-benzophenones into 2-(acylamino-R-propionylamido)-benzophenones, in 80% yield. A lyophilized preparation of the active enzyme complex derived from ultrasonicated cells showed virtually no loss of activity after 4 months of storage at 4-5°C in 1/15 M K,Na-phosphate buffer with 10% glycerol, pH 5-7. In addition, 74% of the initial activity was retained after 2 h at 40°C, and 57% after 2 h at 50°C. Cells immobilized in polyacrylamide gel in the identical buffer system supplemented with 20% glycerol retained 70% of the initial activity after storage at 4°C for 35 days. Figures 2; references 13: 6 Russian, 7 Western,

12172/9835  
CSO: 1840/674

LEACHING OF COPPER FROM CHALCOCITE WITH THIOBACILLUS FERROXIDANS GROWN IN CULTIVATOR WITH ELECTRICAL REDUCTION OF FERRIC ION

Novosibirsk IZVESTIYA SIBIRSKOGO OTDELENIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKIYE NAUKI in Russian No 18, Vol 3, Dec 86 (manuscript received 29 Nov 84) pp 66-71

[Article by A.V. Belyy, G.V. Denisov and B.G. Kovrov, Institute of Biophysics, Siberian Department, USSR Academy of Sciences, Krasnoyarsk]

[Abstract] Hydrometallurgical processing of nonferrous metal ores has attracted attention. Bacterial leaching of sulfide mineral ores and their concentrates with *T. ferrooxidans* is quite promising, but requires the production of large masses of these bacteria. The task of the present work was to study the ability of a culture of *T. ferrooxidans* grown in an installation with electrical reduction of trivalent iron to oxidize a sulfide mineral--chalcocite--and to study the mechanism of its bacterial leaching. It was found that

*T. ferrooxidans* can rapidly leach copper from chalcocite, yielding up to 3.75 g/(l·hr<sup>-1</sup>) copper from a solution containing 30 g/l copper as chalcocite, biomass 3 g/l, iron 1.5 g/l. Bacterial oxidation of chalcocite follows an indirect mechanism involving trivalent iron. Practically all cells during leaching are in the freely floating state, not the attached state. Figures 8; references 14: 9 Russian, 5 Western.

6508/9835

CSO: 1840/675

UDC 636.2:636.082.252

#### CHANGE IN FERTILITY OF BLACK VARIEGATED BREED COWS RESULTING FROM INBREEDING DEPRESSION

Moscow DOKLADY VSESOYUZNOY ORDENA LENINA I ORDENA TRUDOVOGO KRASNOGO ZNAMENI AKADEMII SELSKOKHOZYAYSTVENNYKH NAUK IMENI V.I. LENINA in Russian No 8, Aug 86 (manuscript received 27 Dec 85) pp 20-22

[Article by S.N. Kharitonov, All-RSFSR Scientific Research Institute of Pedigree Breeding]

[Abstract] Introduction of artificial insemination into cattle breeding led to specific selections of the breeding stock but at the same time resulted in greater inbreeding. Literature data on the effect of inbreeding on milk productivity are controversial. This effect was studied on 9391 cows from Podol breeding farm, 18.8% of which were inbred. It was shown that inbred cows produced 334 kg less milk and weighed about 16 kg less. Inbred cows exhibited more pronounced effects of "father" genotypes than the randomly bred animals. The data supported the hypothesis of inbreeding depression in the offspring. Therefore, in large breeding operations bulls of different lineage should be rotated to exclude the possibility of massive natural inbreeding. References: 7 Russian.

7813/9835

CSO: 1840/1075

UDC 616.94-022.7:579.861.1]-036.111-06:616-001.36-085.38.015.2:615.246.2

SIGNIFICANCE OF HEMOSORPTION IN SEPTIC SHOCK COMPLICATED BY POLYORGANIC  
INSUFFICIENCY IN FULMINATING MENINGOCOCCEMIA

Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 57, No 9, Sep 86  
(manuscript received 30 Dec 85) pp 117-122

[Article by V.I. Pokrovskiy, G.G. Radzivil, V.B. Beloborodov, Yu.V. Bronyakin,  
I.M. Roslyy and A.M. Gracheva, Central Institute of Epidemiology, USSR  
Ministry of Health, Moscow]

[Abstract] An analysis was conducted on the efficacy of hemosorption in the management of 20 male and female patients with septic shock and polyorganic insufficiency with underlying fulminating meningococemia. The case studies were analyzed in terms of outcome, with 10 of the patients succumbing. The latter cases were characterized by particularly advanced organ insufficiency with especially affected renal, adrenal and cephalic components. Anamnestic information also revealed that hospitalization of the deceased patients was delayed twice as long as that of the survivors. Hemoperfusion with sorption was carried SKN and GS-01 adsorbents for  $110 \pm 6$  min per session, at a rate of 76 ml/min. The effects of hemosorption were particularly noticeable in improving microcirculation and enhancing myocardial function, as well as in mitigating toxemia. The method can be successfully employed on a temporary basis for stabilizing the clinical state prior to institution of other indicated therapeutic modalities. References 13: 12 Russian, 1 Western.

12172/9835  
CSO; 1840/1097

## SIGNIFICANCE OF DIFFERENT SPECIES OF COMMON SHREWS IN NATURAL FOCI OF TICK-BORNE ENCEPHALITIS

Moscow BYULLETEN MOSKOVSKOGO OBSHCHESTVA ISPITATELNOY PRIRODY. OTDEL BIOLOGICHESKIY in Russian Vol 92, No 2, Mar-Apr 87 (manuscript received 10 Dec 85) pp 3-12

[Article by L.A. Khlyap, L.G. Yemelyanova and B.I. Sheftel]

[Abstract] The number of hosts for tick-borne encephalitis (TBE) virus is large and therefore a comparative analysis of such hosts is overdue. The goal of this study was to identify species of Soricidae which could play an important role in TBE foci. A diagrammatic map was constructed showing the dominant species of Soricidae within the borders of TBE territory. It was shown that, of the magnitude of possible vectors, there are only two principal shrew hosts of tick vectors: *Sorex araneus* and *S. caecutiens*. In some areas other shrews may play a role: *S. isodon* in southern Siberia and Sikhote-Alin mountains and *S. unguiculatus* in the Sakhalin islands. Other shrews had no real role in this problem. Because of the paucity of data, it is impossible to carry out this comparative analysis beyond this species. Figures 1; references 59: 55 Russian, 4 Western.

7813/9835

CSO: 1840/827

## SEROLOGIC CHARACTERISTICS OF SMALL MAMMAL POPULATIONS IN TICK-BORNE ENCEPHALITIC FOCI IN WESTERN SAYAN AND POSSIBILITY OF EVALUATING EPIZOOTIC INTENSITY BY THESE DATA

Moscow BYULLETEN MOSKOVSKOGO OBSHCHESTVA ISPITATELNOY PRIRODY. OTDEL BIOLOGICHESKIY in Russian Vol 92, No 2, Mar-Apr 87 (manuscript received 2 Jul 84) pp 12-17

[Article by V.P. Gutova and R.L. Naumov]

[Abstract] Small mammals are important vectors of tick-borne encephalitis (TBE). Data from many studies vary substantially, probably due to relationships between viruses and animals specific for each area. Therefore, data obtained during many years of the study of immunity of different animals and its alteration could be of interest. Field studies were performed during 1967-1981 in western Sayan mountains; 22539 animals of 25 species were captured and tested serologically. No significant difference could be identified between the immunity of various species; therefore other studies were performed with the entire group of animals. The level of



immunity increased during June-August period probably due to the dominant role of the taiga tick larvae and nymphs in infecting these small mammals. In estimating the intensity of ascending branch of the virus circulation cycle from animals to the tick, one should consider the epizootic range correlation between dominant species of small mammals and the viral strains. References 20: 19 Russian, 1 Western.

7813/9835  
CSO: 1840/827

UDC 616.936.2-036.8-06:616.411-001.5

#### FLARING OF LATENT MALARIA FOLLOWING RAUMA RELATED SPLENECTOMY

Moscow KLINICHESKAYA MEDITSINA in Russian No 10, Oct 86  
(manuscript received 5 Mar 86) pp 136-137

[Article by V.A. Vasin, V.A. Martynov, I.V. Vasin and V.A. Orlov, Departments of Pathological Anatomy (Chairman P.A. Chumachenko) and Infectious Diseases (Chairman V.G. Chaytsev), Ryazan Medical Institute imeni I.P. Pavlov]

[Abstract] In spite of favorable epidemiological indications, malaria is still a problem in the USSR because of increased rate of its importation from abroad. Spleen rupture is one of the most serious complications of malaria, especially among the newly diagnosed cases. A case history is reported covering spleen rupture in a patient with malaria in whom malaria complicated with fever paroxysms developed after splenectomy. The removed spleen showed characteristic morphological signs of malaria. This observation can be treated as a primary presentation of malaria caused by spleen rupture and splenectomy. The three day malaria may involve intermittent or daily fever, especially early in the development of this disease. References 5: 4 Russian, 1 Western.

7813/9835  
CSO: 1840/1109

UDC 575.576.8

MORPHOLOGIC AND BIOCHEMICAL CHARACTERISTICS OF MUTANT LINES AND INITIAL FORMS OF WHEAT

Tbilisi IZVESTIYA AKADEMII NAUK GRUZINSKOY SSR SERTIYA BIOLOGICHESKAYA  
in Russian Vol 12, No 6, Nov-Dec 86 (manuscript received 10 Oct 84)  
pp 433-437

[Article by Z.V. Goldenberg, A.D. Gorgidze, deceased, and O.T. Khachidze,  
Institute of Botany, GSSR Academy of Sciences, Tbilisi; Georgian Agricultural  
Institute, Tbilisi; Institute of Plant Biochemistry, GSSR Academy of Sciences,  
Tbilisi]

[Abstract] Genetic selection work with wheat by the method of experimental mutagenesis at the Institute of Botany has isolated a number of constant mutation lines from various species of polyploid wheat: *T. monococcum* var. *hornemaniae* Clem ( $2n=14$ ), *T. timopheevi* var. *typicum* Zhuk. ( $2n=28$ ) and *T. aestivum* var. *alborubrum* Korn. ( $2n=42$ ). This work presents a study of the variability of biochemical indices and primary selection of lines with high content of protein and essential amino acids in mutants and their initial forms. In addition to plants in which just one characteristic was altered by radiation-reduced mutation, forms were also produced with changes in several economy-important characteristics. It is not known whether all characteristics were influenced by a single gene, or several genes were modified simultaneously. Lines were produced which differed from the initial forms not only in morphological characteristics but, also, in biochemical indicators such as protein and tryptophan content. Mutant lines with high protein content were produced. Figures 1; references 8: 7 Russian, 1 Western.

6508/9835  
CSO: 1840/763

EXTRA-CELLULAR VIRUS-LIKE PARTICLES CONTAINING SEQUENCES HOMOLOGOUS TO MOBILE  
DISPERSED GENETIC ELEMENTS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 293, No 1, Mar 87  
(manuscript received 27 May 86) pp 225-228

[Article by T.V. Gorelova and N.G. Shuppe, Institute of General Genetics  
imeni N.I. Vavilov, USSR Academy of Sciences, Moscow]

[Abstract] A study performed with the use of line 67j25D cells, grown on KSh-10 medium containing 5 percent fetal calf serum, showed that, during recultivation of resown lines of the Drosophila cells, virus-like particles containing sequences homologous to mobile dispersed genetic elements and possessing reverse transcriptase activity may pass from the cells into the culture medium and exist there in extra-cellular form. It was found that reverse transcriptase functions within these particles, that is, intermediate forms could be found, similar to those previously isolated from whole cells. The activity of these particles after centrifugation in a sucrose density gradient is described and discussed. The transposition of the mobile dispersed genetic elements in the Drosophila cells includes formation of virus-like particles in which occur the entire cycle of reverse transcription of RNA of the corresponding mobile dispersed genetic element. The possibility that the particles were liberated from the cells randomly during non-specific breakdown of the cells is refuted. Figures 2; references 15: 2 Russian, 13 Western.

2791/9835  
CSO: 1840/577

UDC 612.017.1:612.6.05 + 015.371

FROM SYNTHETIC ANTIGENS TO SYNTHETIC VACCINES. PART 2. COMMUNICATION.  
SYNTHETIC VACCINES

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 103, No 1, Jan-Feb 87  
pp 3-17

[Article by R.V. Petrov and R.M. Khaitov, Institute of Immunology, USSR  
Ministry of Health, Moscow]

[Abstract] Synthetic vaccines should carry, on their macromolecules, not only determinant fragments of antigens but also structures assuring production of antibodies to various antigens regardless of the genetic background of the immunized individual; this conclusion arose from studies of immunopotentiating action of synthetic polyelectrolytes. Literature data were reviewed on experimental approaches to synthetic vaccines. Two models were selected for specific attention: mouse typhus and influenza infection. Highly effective immunizing complexes could be synthesized representing a new approach to vaccination based on above principles of converting weakly-immunogenic, isolated surface antigens into highly-immunogenic preparations with vaccination activity achieved by covalently binding them with synthetic immunostimulators, the polyelectrolytes. The next step involves totally synthetic vaccines consisting of chemical conjugates of N-terminal peptide HA<sub>2</sub>-subunit of viral hemagglutinin with polyionic immunomodulators. Two flow-charts are presented for production of synthetic antigens and for synthetic vaccines. Figures 3; references 45: 32 Russian, 13 Western (3 by Russian authors).

7813/9835

CSO: 1840/818

## BRAIN SPECIFIC PROTEINS OF S-100 GROUP AND SYSTEMIC INTEGRATION OF MOLECULAR PROCESSES IN NERVE TISSUES

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 103, No 1, Jan-Feb 87  
pp 124-132

[Article by A.B. Poletayev and V.V. Sherstner, Scientific Research Institute of Normal Physiology imeni P.K. Anokhin, USSR Academy of Medical Sciences, Moscow]

[Abstract] One of the more promising directions in studies of molecular principles for integrated activity of the nervous system is the study of the role of protein molecules, especially the brain-specific proteins in biological processes. The brain proteins are unique products of the biosynthetic activity of neurons and glial cells. One group of these proteins, the S-100 group, is found in nerve cells of a multitude of animals from molluscs and insects to mammals and humans, showing great evolutionary stability. This literature review deals with the S-100 group of brain-specific proteins. The biological function of these proteins is due to their participation in systemic functional metabolic linking, a fine co-adjustment and mutual conformity of a multitude of relatively autonomous events occurring in the nerve cells. These proteins participate in the processes of synaptic transfer, in crossmembrane transport of ions and aminoacids, exchange of neuromediators, regulation of RNA and protein synthesis in glial cells; this is possible because of their molecular and functional heterogeneity. Without substituting for any key metabolic chains, they participate in their systemic integration. References 53: 31 Russian (2 by Western authors), 22 Western.

7813/9835

CSO: 1840/818

## CHARACTERISTICS OF SENSITIZING AND ANAPHYLACTOGENIC PROPERTIES OF PROTEIN-SACCHARIDE BRUCELLAE ANTIGEN

Alma-Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR. SERIYA BIOLOGICHESKAYA in Russian No 6, Nov-Dec 86 pp 60-63

[Article by T.S. Dzhasybayeva, G.S. Sukhodoyeva and Ye.A. Dranovskaya, Scientific Research Institute of Cardiology, KaSSR Ministry of Health]

[Abstract] Reagents are needed without sensitizing properties for allergy diagnosis and treatment of brucellosis. Widely used brucelline is not satisfactory because of a number of undesirable properties, mostly of qualitative nature. Protein-saccharide antigen (PSA) was evaluated; it was

obtained from the cell wall of *S. form brucellae* in the Brucellosis Laboratory of the Institute of Epidemiology and Microbiology imeni Gamaleya, USSR Academy of Medical Sciences. PSA had the following composition: 30% protein, 55% sugars; it was safe for the use, weakly reactive with distinct immunogenecity. During the experiments no local reactions towards PSA was noted. Overall, the anaphylactogenic properties of PSA were so weak that it could be recommended for medical and veterinary use. References 7: 6 Russian, 1 Western.

7813/9835  
CSO: 1840/762

UDC 612.112.94;612.6+612.112.94.015.2:577.123.3].014.46:615.31:547.95:547.  
943

STUDY OF INFLUENCE OF  $\beta$ -ENDORPHIN AND MYELOPEPTIDES ON LEVEL OF cAMP AND  
PROLIFERATION OF LYMPHOCYTES IN VITRO

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,  
No 12, Dec 86 (manuscript received 13 Nov 85) pp 731-733

[Article by A.A. Zozulya, E. Patsakova, N.V. Kost, A.M. Ivanushkin and  
T.L. Voronkova, All-Union Science Center of Mental Health, USSR Academy of  
Medical Sciences, Moscow]

[Abstract] This article reports continued study of the immunomodulating properties of  $\beta$ -endorphin and attempts to determine the possible contribution of opioids to the effect of one immunologically-active preparation (myelopeptide). The results indicate that  $\beta$ -endorphin interacts with a heterogeneous population of opiate receptors of the lymphocytes.  $\beta$ -Endorphin is apparently involved in the pathogenesis of immunosuppression observed during stress. Myelopeptide, without influencing spontaneous proliferation of lymphocytes, reliably decreases the inclusion of  $^3\text{H}$ -thymidine in cells stimulated by optimal doses of phytohemagglutinin. Naloxone does not block these effects. Myelopeptide causes a decrease in the level of cAMP in the lymphocytes, which is blocked by naloxone. Inclusion of bacitracin in the reaction medium does not influence the level of cAMP in the cells, but does decrease the effect of the myelopeptide. The results indicate the promise of using the immunomodulating properties of synthetic  $\delta$ -type opiate receptor ligands. Figures 2; references 15: 8 Russian, 7 Western.

6508/9835  
CSO: 1840/736

UDC 616.831.83-02:613.644]-07

INFLUENCE OF VIBRATION AND HYPERBARIC OXYGENATION ON BRAIN STEM RETICULAR FORMATION IN ANIMALS

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 4,  
Apr 86 p 52

[Article by A.A. Nenashev, M.T. Pacheva, I.M. Tishchenko and V.I. Chausov,  
Kabardino-Balkarsk University, Nalchik]

[Abstract] Guinea pigs were subjected to whole body vibration: duration 90 minutes, frequency 50 Hz, amplitude 0.3 mm, each day for 90 days. Some animals received hyperbaric oxygenation after every third vibration session: oxygen pressure 2 atm.abs., duration 90 minutes, 30 sessions total. The animals were then sacrificed by decapitation and brain stem reticular formation tissues studied. In the animals which received vibration alone, changes in the reticular formation were much more clearly expressed, including some irreversible changes not observed in the animals which also received hyperbaric oxygenation. Pathologic changes were strongest in the lower segments.

6508/9835  
CSO: 1840/716

UDC 616.361-002.272-085:615.849.19

LASER TREATMENT OF BENIGN BILE DUCT OBSTRUCTION

Leningrad VESTNIK KHIRURGII IMENI I.I. GREKOV in Russian No 11, Nov 86  
(manuscript received 4 Apr 86) pp 11-15

[Article by A.F. Mokeyev, Department of General Surgery (Headed by  
Professor V.S. Zemskov), Kiev Medical Institute imeni Academician  
A.A. Bogomolets]

[Abstract] Considering the biostimulating effect of low intensity laser radiation, the authors used intravenous laser irradiation of the blood in surgical treatment of patients with benign bile duct obstruction. Laser irradiation was started one day after surgery and facilitated a favorable course of the post-operative period, yielding more rapid positive dynamics of a number of clinical signs: decrease in abdominal pain, restoration of peristalsis, normalization of body temperature, decrease in liver size, regression of cholestasis symptoms. After 2 or 3 treatments, the patients reported feeling stronger, with increased appetite and normal sleep. Immediately after each session the patients reported slight dizziness, sleepiness and showed normal hemodynamics, body temperature varying by 0.2-0.3°C. The treatment facilitated more rapid restoration of liver function and reduced the number of complications during the post-operative period. References 5: 3 Russian, 2 Western.

6508/9835

CSO: 1840/771



EFFECT OF LASER RADIATION ON PEROXIDE CHEMILUMINESCENCE OF WOUND EXUDATE

Moscow BYULLETen EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 10, Oct 86 (manuscript received 1 Jul 85) pp 426-428

[Article by A.R. Romm, M.P. Sherstnev, V.V. Volkov and Yu.A. Vladimirov, Department of Biophysics (Headed by Corresponding Member of the USSR Academy of Medical Sciences, Professor Yu.A. Vladimirov), Medical-Biological Department and Department of Pediatric Surgery (Headed by Academician, USSR Academy of Medical Sciences, Professor Yu.F. Isakov), Second Moscow Medical Institute imeni N.I. Pirogov]

[Abstract] The purpose of this work was to develop a method for recording peroxide chemiluminescence of wound exudate and to study the influence of laser radiation on the phenomenon. Experimental studies were performed on skin fascies wound healing by secondary intention. The wound exudate was taken during changing of dressings by standard sterile filter paper disks bound to the wound surface for 15 minutes, then placed in a flask containing 3 ml of 0.1 M phosphate buffer pH 7.4 for 15-30 minutes elution with mechanical agitation. Studies of the effect of laser radiation on regeneration processes in wounds indicated that chemiluminescence following irradiation decreases, the condition of the wound improves and the rate of healing rises. Laser radiation was found to increase catalase activity sharply, which influences both chemiluminescence in the presence of  $H_2O_2$  and wound-healing processes, decomposing  $H_2O_2$  without forming active oxygen, facilitating the development of peroxidation of lipids and leading to chemiluminescence. Catalase acts as a water-soluble antioxidant, activated by laser radiation, strengthening the process of regeneration. Figures 3; references: 14 Russian.

6508/9835

CSO: 1840/733

PROBLEMS OF LABOR HYGIENE AND PROTECTION OF HEALTH OF PERSONS WORKING WITH LASERS IN MEDICINE (LITERATURE REVIEW)

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 4, Apr 86 (manuscript received 28 Aug 85) pp 37-40

[Article by V.A. Kashuba and O.G. Polskiy, Moscow Medical-Sanitary Institute imeni N.A. Semashko]

[Abstract] A review is presented of the Soviet and some Western literature on medical laser safety. The major danger of medical lasers is uncontrolled direct and reflected laser radiation, with diffuse laser radiation, heat,

magnetic fields and other factors representing less danger. A classification of laser types has been developed, ranging from rank 0, closed laser installations in which no radiation escapes, through rank III, medical laser installations in which laser radiation is intentionally applied to the patient. Special laser surgical tools have been developed, intended to protect operating personnel from reflected laser radiation. Protective equipment, particularly goggles, has been developed and is recommended for use by medical personnel. Further studies are needed for development of accident-protection programs, hygiene and safety programs for medical personnel using lasers in their work. Greater attention should also be given to this area in university training of medical personnel. References 33: 28 Russian, 5 Western.

6508/9835

CSO: 1840/716

UDC 616-018.6-001.4-002.2-089:615.849.19

#### USE OF LOW INTENSITY LASER IRRADIATION IN TREATMENT OF PURULENT WOUNDS

Leningrad VESTNIK KHIRURGII IMENI I.I. GREKOV, in Russian Vol 138, No 3, Mar 87 (manuscript received 30 Jul 86) pp 61-63

[Article by V.K. Gostishchev, professor, V.A. Vertyanov, docent, A.N. Novochenko, U.V. Shur, A.G. Khurshudyan, M.A. Sopromadze and V.A. Antsyshkin, Department of General Surgery of Therapeutic Faculty (Chairman V.I. Struchkov) First Moscow Medical Institute imeni I.M. Sechenov; Clinical Hospital No 23 imeni "Medsantrud" (Chief Physician: A.S. Kultyshev), Moscow]

[Abstract] Clinical observations were reported concerning the use of a laser beam (helium-cadmium laser LPM-II and helium-neon laser OKG-12) in treating purulent wounds. In all 372 patients were involved, 187 being treated with laser. It was shown that laser irradiation did not affect biological properties not the sensitivity of microorganisms to antibacterial preparations. Stimulating effect of coherent blue light on reparative processes of purulent wounds led to faster healing and shorter hospital stay; the wounds were cleaned from pyo-necrotic debris, epithelization resulted in minimal scarring. Functional and cosmetic treatment results improved and patient rehabilitation was much faster. References: 4 Russian.

7813/9835

CSO: 1840/812

## PHYSICAL CHEMICAL MECHANISMS OF BIOLOGICAL ACTIVITY OF LASER RADIATION

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 103, No 1, Jan-Feb 87  
pp 31-43

[Article by N.D. Devyatkov, S.M. Zubkova, I.B. Laprun and N.S. Makeyeva,  
Moscow]

[Abstract] Wide use of low intensity laser beams in medicine and biology led many investigators to study physical chemical mechanisms of their biological activity. In the present paper, literature data covering principally helium-neon laser beam was reviewed. Structural-functional rearrangements of cell membranes and intracellular organelles form the basis for biostimulating action of laser radiation. This could be due to resonance absorption by a receptor in a specific spectrum range or by appearance of vibrational-excitation states resulting in an altered level of peroxide oxidation of lipids and conformation of local membrane segments. As a result, a physical chemical basis is created for the formation of nonspecific cell reactions: change of ionic permeability and activity of adenylatecyclase and ATPase systems which in turn result in intensified bioenergetic and biosynthetic processes. This complex of changes on cellular level facilitates development of reductive reactions in respective tissues, intensifies their functional potential and the resistance of the whole organism. Figures 2; references 77: 58 Russian (4 by Western authors), 19 Western (1 by Russian author).

7813/9835

CSO: 1840/818

UDC 616.12-005.4-089:616.13/.14-089.843-032:611.127]

## MORPHOLOGIC BASIS OF LASER REVASCULARIZATION OF MYOCARDIUM

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 98,  
No 12, Dec 84 (manuscript received 22 Oct 83) pp 737-739

[Article by V.I. Yeliseyenko, O.K. Skobelkin, Ye.I. Brekhov, and  
S.R. Zdradovskiy, Fourth Chief Directorate, USSR Ministry of Health, Moscow]

[Abstract] Experiments have been performed on revascularization of the myocardium by powerful pulsed laser beams. In experiments on 30 mongrel dogs, 20-30 microperforations of the left ventricle were produced by pulses from a carbon dioxide laser with an energy of 20J, pulse length 8-100 ms. Light tampon pressure with a hemostatic sponge for 2-4 minutes stopped the bleeding from the perforations. Ligation of the left coronary artery was used to model myocardial infarction. 83% of the animals receiving laser revascularization following model infarction survived, as well as 100% of animals receiving laser revascularization prior to model infarction. 100% of animals receiving

model infarction alone died. Laser revascularization is simpler, more effective and less dangerous than coronary artery surgery, does not require artificial blood circulation and can be used as a method of preventing heart attacks in cases of occlusion of the coronary arteries. Figures 3; references 10: 4 Russian, 6 Western.

6508/9835

CSO: 1840/728

UDC 617.741-004.1-089,28-06-089:617.721-089,85:615.849.19

# IRIDIC CIRCULATION FOLLOWING YAG-LASER POSTERIOR DISCISSION IN PATIENTS WITH ARTIPHAKIA

Moscow VESTNIK OFTALMOLOGII in Russian Vol 102, No 6, Nov-Dec 86  
(manuscript received 2 Jun 86) pp 34-36

[Article by V.Ya. Kishkina and A.D. Semenov, candidates of medical sciences, L.A. Kryl and D.A. Magaramov, candidate of medical sciences, Moscow Scientific Research Institute of Ophthalmic Microsurgery, RSFSR Ministry of Health]

[Abstract] Fluorescent iridography was employed in monitoring the hemodynamic status of the iris following YAG-laser (Coherent model 9900, 1.0-2.0 mJ/pulse,  $10^{-8}$  sec pulses, 10  $\mu$ m diameter spots, 30-50 pulses total) posterior discission. The cohort consisted of 27 (40-65 years) patients with membranous after-cataracts following extracapsular extraction of cataracts and implantation of Fedorov-Zakharov iris-clip lens. Following the laser procedure, the status of iridic circulation was found to be dependent on the antecedent hemodynamics. The post-surgical reactive period (up to 2 days) was longer in patients with inflammatory or micro-circulatory complications and further complicated by intraocular hypertension. Use of the YAG-surgery in patients with normal iridic hemodynamics was not followed by post-laser intraocular hypertensive episodes, with complete stabilization of all the clinical signs within 24 h. The observations were also consonant with the view that YAG-laser posterior discission should not be attempted within 6 months of implantation of the iris-clip lens. References 4: 2 Russian, 2 Western.

12172/9835

CSO: 1840/678

LASER THERAPY OF MANDIBLE FRACTURES

Leningrad VESTNIK KHIRURGII in Russian No 6, Jun 86  
(manuscript received 2 Apr 84) pp 93-96

[Article by A.G. Kats, V.I. Zausayev, L.A. Vavilina, L.A. Maleyeva, N.S. Makeyeva and Ye.M. Oleynik, Department of Propaedeutic Surgical Stomatology, (Chairman V.I. Zausayev), Moscow Medical Stomatological Institute imeni N.A. Semashko]

[Abstract] Laser therapy is advocated for the treatment of inflammatory complications and acceleration of reparative processes of mandible fractures. Observations were reported on 46 patients, 17-51 years old who presented with complicated mandible fractures. One group was treated with a standard method using only antibiotics, the other received in addition also laser radiation (helium-neon beam, intensity 1 mV/cm<sup>2</sup>, wavelength 0.63 um). All patients healed well, but the process was substantially faster in the group receiving laser irradiation. It seemed that the laser intensified the activity of alkaline phosphatase, speeded up the liquidation of inflammatory reactions, acted as a pain killer, reinstated nerve conductivity and regenerated bone tissue. References 11: 10 Russian, 1 Western.

7813/9835  
CSO: 1840/1071

UDC 591.1

STRUCTURAL-FUNCTIONAL ORGANIZATION OF NORTHERN FUR-SEAL (*CALLORHINUS URSINUS*)  
ACOUSTIC ANALYZER PERIPHERAL REGION

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 293, No 2, Mar 87  
(manuscript received 26 Sep 86) pp 450-455

[Article by G.N. Solntseva, Institute of Developmental Biology imeni N.K. Koltsov,  
USSR Academy of Sciences, Moscow]

[Abstract] A description of the peripheral section of the acoustic analyzer of the northern fur seal showed similarities of structural and functional organization with that of terrestrial, aquatic and echo-ranging forms of mammals. Structural similarity with that of land mammals includes the presence of an aural cavity, a straight or conical acoustic duct with oval-circular cross-section and a growing together of the b. tympani and skull bones and its participation in formation of the cranial wall. Structural similarities with water mammals include the formation of venus sinuses in the bony section of the acoustic duct and bony walls, surrounding the cavity, a thickening of the mucous membrane investing the drum cavity, increased rigidity in the union of the acoustic ossicles right up to complete intergrowth of the malleus and anvil in the region of the ossicle-anvil articulation. Similarity with the structure in echo-sounding mammals includes the union of a well developed secondary lamina ossea and a narrow basilar membrane which indicates the capacity of the northern fur seal to perceive ultrahigh sound signals via the acoustic system. The structure of the inner, middle and outer ear are discussed separately. Figures 1; references 10: 7 Russian, 3 Western.

2791/9835  
CSO: 1840/606

UDC 616-001.36-08:612.429

EXTRACORPORAL XENOSPLEEN CONNECTION IN SHOCK-TRAUMA PATIENTS

Leningrad VESTNIK KHIRURGII IMENI I.I. GREKOV in Russian No 11, Nov 86  
(manuscript received 23 May 86) pp 81-86

[Article by M.V. Grinev, A.B. Tsypin, M.N. Tarelkina, A.A. Makarova, L.P. Piyovarova, N.K. Razumova, G.M. Frolov and Yu.N. Tsibin, Leningrad Scientific Research Institute of Emergency Medicine imeni I.I. Dzhanelidze (Director, Professor M.V. Grinev), Moscow Scientific Research Institute of Transplantology and Artificial Organs, (Director, Corresponding Member, USSR Academy of Sciences, V.I. Shumakov]

[Abstract] Severe mechanical trauma plus shock is always accompanied by infectious and noninfectious intoxication with immune system depression. In 1985, extracorporeal connection of a freshly removed pig spleen was first used to treat peritonitis and sepsis, showing that the xenospleen has a clear detoxifying effect. Extracorporeal xenospleen connection was performed with a vein-vein shunt with blood movement supported by a roller pump. The connection was maintained for 35 minutes with a volumetric rate of 50 ml/min. An average of 15,000 units of heparin was used during perfusion. Blood specimens were taken before connection, 1 hour and 1 day after perfusion. Blood specimens were taken before connection, 1 hour and 1 day after perfusion. In some cases, the process was repeated. Clinical effects usually appeared the morning after perfusion, including increased appetite, clearer consciousness, reduced body temperature and pulse rate. References 9: 5 Russian, 4 Western.

6508/9835

CSO: 1840/771

EXTRACORPORAL XENOSPLEEN PERFUSION IN TREATMENT OF PURULENT SURGICAL DISEASE

Leningrad VESTNIK KHIRURGII IMENI I.I. GREKOV in Russian No 11, Nov 86  
(manuscript received 8 Apr 86) pp 86-91

[Article by K.P. Zhidkov, Yu.A. Medvedev, Ye.K. Dobrynskiy, S.M. Kopylov and L.A. Belova, City Hospital #26 (Chief Physician, Ye.S. Zheleznyak, Leningrad]

[Abstract] Extracorporeal perfusion through a pig spleen was utilized in 5 purulent surgical disease cases. The method was used only in cases in which traditional treatment of septic complications of surgical disease had been ineffective. The process was ineffective in 3 cases. After brief clinical improvement for 1 day following perfusion, consisting of moderation of encephalopathy, stabilization of hemodynamics and improvement of peripheral circulation, the processes of septicemia and endogenous intoxication progressed and the patients died. In all 3 cases autopsy revealed undiagnosed purulent infectious foci. In two cases, the process was performed twice at intervals of 10-12 days. In two other cases after 1 perfusion, indications of intoxication, microcirculatory disorders, respiratory insufficiency and toxic anemia disappeared within 2-3 days, followed by full recovery. A case history is presented. Figures 4; references 12: 5 Russian, 7 Western.

6508/9835  
CSO: 1840/771

UDC 615.384:547.963.4].034.07

HEMOGLOBIN POLYMERS IN ANIMAL CIRCULATION

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 10, Oct 86 (manuscript received 28 Dec 85) pp 421-423

[Article by M.A. Azhigirova, Ye.P. Vyazova, M.G. Vashkevich, R.V. Nedoshivina and A.A. Khachatur'yan, Blood Substitutes Laboratory (Headed by Professor G.Ya. Rozenberg), Laboratory of Pathologic Physiology (Headed by Professor N.A. Gorbunova), Central Scientific Research Institute of Hematology and Blood Transfusion, USSR Ministry of Health, Moscow]

[Abstract] The rapid excretion of hemoglobin from the blood stream through the renal tubules has stimulated the creation of hemoglobin-based polymers which, but to their increased molecular weight, should be retained in the blood. This article studies the influence of the molecular mass of various hemoglobin polymers on their retention time in the circulation of experimental animals. Hemoglobin was modified with glutaric aldehyde and pyridoxal-5'-phosphate. Native and polymerized hemoglobin were studied in 32 rabbits by iv. administration at 1 g/kg. Blood samples were taken after 5 minutes,



2, 4, 6, 18 and 24 hours. Results were statistically processed. It was found that the higher the degree of polymerization, the longer the half life of the hemoglobin in the blood stream. However, the life of the hemoglobin in the blood stream was also influenced by other factors, particularly the capability of the polymers to interact with plasma proteins. Figures 3; references 7: 1 Russian, 6 Western.

6508/9835  
CSO: 1840/733

UDC 615.918:582].015.44:616.36=018.1-076.4

#### ULTRASTRUCTURE OF MOUSE HEPATOCYTES IN CHRONIC T-2 MYCOTOXICOSIS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 10, Oct 86 (manuscript received 14 Feb 86) pp 482-485

[Article by L.V. Kravchenko, S.I. Khvylya and A.B. Levitskaya, Institute of Nutrition, USSR Academy of Medical Sciences, Moscow]

[Abstract] A study is presented of the influence of long-term administration of small quantities of T-2 toxin on the ultrastructure of mouse hepatocytes. T-2 toxin was administered at 0.33 mg/kg body weight (1/20 LD<sub>50</sub>) for 1 month and a 1.45 mg/kg for the next 5 months. The animals were decapitated one day after the last administration and liver tissue was taken for electron microscope examination. Cell structure disorders were observed in the liver parenchyma of the experimental animals. All cells showed structural disorders, primarily large and small foci of clarified cytoplasm distributed throughout the cells. The number of primary and secondary lysosomes increased and regenerative foci were observed in most liver cells. Figures 3; references 11: 8 Russian, 3 Western.

6508/9835  
CSO: 1840/733

CLINICAL-LABORATORY DIAGNOSIS OF ACQUIRED IMMUNODEFFICIENCY SYNDROME  
(LITERATURE REVIEW)

Moscow LABORATORNOYE DELO in Russian No 1, Jan 87 (manuscript received 12 Jun 86)  
pp 3-13

[Article by A.N. Cheredeyev, Second Moscow Medical Institute imeni N.I. Pirogov,  
Moscow]

[Abstract] Although clinical aspects of AIDS [SPID in Russian] were adequately covered by domestic literature, the methodology of laboratory diagnostic techniques was not; therefore a literature review is presented covering the epidemiology of AIDS, clinical manifestations, laboratory diagnostic methods and therapy. Six risk groups were highlighted in the epidemiological section: homosexual males, drug addicts, Haitians, Central Africans, hemophiliacs and a mixed group. Clinically, attention is directed at opportunistic infections, pneumocystic carinii infections, cryptosporidii, toxoplasma gondii, bacteria, salmonella, fungi, cryptococcus neoformans, cytomegalovirus, herpes simplex, JC-virus and Kaposi sarcoma. Four diagnostic methods are discussed: immunologic, virologic, microbiologic and cytologic. The treatment section is rather dated and general. None of the new therapeutic agents are mentioned, except for the early studies with interferon and interleukin-2. References 70: 5 Russian, 65 Western.

7813/9835

CSO: 1840/814

EFFECT OF BIOLOGICALLY ACTIVE DRESSINGS ON DEVELOPMENT OF WOUND PROCESS

Leningrad VESTNIK KHIRURGII IMENI I.I. GREKOV in Russian Vol 138, No 3  
(manuscript received 10 Feb 86) pp 57-60

[Article by P.C. Tolstykh, doctor of medical sciences, V.K. Gostishchev, professor, A.G. Khanin, M.Yu. Yusuf, R.K. Aboyants and V.A. Antsyshkin (Department of General Surgery, First Moscow Medical Institute imeni I.M. Sechenov (Director: Academician V.I. Struchkov), 23rd Municipal Hospital imeni "Medsantrud" (Chief Physician A.S. Kultyshev)]

[Abstract] A comparative analysis was performed of the application of dressings impregnated with biologically-active materials: collocyl, trypsin immobilized on textile cellulose matrix, trypsin immobilized on caprone (synthetic textile matrix), gauze with proteolytic enzyme solution and with 10% NaCl. These dressings were used on purulent wounds with obvious hyperemia. 4-5 Days after surgery and 3-4 days after application of these

dressings, the wounds were free of pus, necrotic masses and fibrin; hyperemia and edema disappeared and pain lessened substantially. Collocyl appeared to have had an edge over the other agents in accelerating the healing process.

7813/9835

CSO: 1840/812

UDC 617.7-001.4-06-089.168-073.756.8:681.31

#### DIAGNOSTIC VALUE OF CAT SCANS IN POST-TRAUMATIC SURGERY OF COMPLICATED EYE WOUNDS

Moscow VESTNIK OFTALMOLOGII in Russian Vol 102, No 6, Nov-Dec 86  
(manuscript received 2 Jun 86) pp 45-47

[Article by R.A. Gundorova and A.F. Brovkina, professors, T.G. Bagaturiya, V.V. Valskiy and V.P. Bykov, Departments of Traumatology, Reconstructive Surgery and Ocular Prostheses and of Ophthalmooncology and Radiology, Moscow Scientific Research Institute of Eye Diseases imeni Gelmgolts]

[Abstract] The diagnostic value of CAT scans was evaluated in the case of 40 patients with intraocular foreign bodies, and in the selection of the surgical approach. The CAT scans were found to be informative in both respects in permitting accurate localization of the foreign body in relation to adjacent anatomic structures, and in assessing the nature and extent of damage. The latter was of signal importance in the selection of the approach to intra-vitreous surgery. Figures 4; references: 6 Western.

12172/9835

CSO: 1840/678

UDC 617.747-003.215-02:617.7-001]-073.756.8:681.31

#### CAT SCAN DIAGNOSIS OF TRAUMATIC HEMOPHTHALMOS

Moscow VESTNIK OFTALMOLOGII in Russian Vol 102, No 6, Nov-Dec 86  
(manuscript received 16 May 86) pp 47-50

[Article by N.S. Khodzhayev, A.D. Romashchenko, senior scientist, and V.V. Valskiy, Departments of Traumatology, Reconstructive Surgery and Ocular Prostheses and of Ophthalmooncology and Radiology, Moscow Scientific Research Institute of Eye Diseases imeni Gelmgolts]

[Abstract] An evaluative study was conducted on the usefulness of CAT scans in traumatic hemophthalmos and in the selection of optimum therapeutic modalities. Analysis of 29 cases with traumatic hemophthalmos and comparison

with 30 eyes with normal vitreous demonstrated the utility of the method in diagnosis and selection of treatment over conventional radiologic procedures. The advantage of CAT scans was predicated on greater sensitivity, i.e., the ability to detect a 1% change in opacity with CAT scans vs. a 10% change with nontomographic methods. Disadvantages are minor in most cases and related to the need for immobilization of the head and the eyeball. These requirements are particularly difficult to meet in the case of pediatric patients. Figures 2; references 16: 10 Russian, 6 Western.

12172/9835  
CSO: 1840/678

UDC 616.61:615.361.001.6

# PROTECTIVE EFFECT OF EXTERNAL HYPOTHERMAL PRESERVATION ON KIDNEYS OF NEWBORN DONORS

Tbilisi SOOBSHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian Vol 125, No 1, Jan 87 (manuscript received 31 Jan 86) pp 161-164

[Article by T.N. Toidze and L.G. Managadze, Scientific Research Institute of Experimental and Clinical Surgery imeni K.D. Eristavi, GSSR Ministry of Health]

[Abstract] Transplantation of kidneys is limited because of insufficient number of donors. Recently one of the authors showed that kidneys of deceased infants and small children could also be used in transplantations. In this paper, results were reported on preservation of children's kidneys. Experiments were done on dogs. Standard methods were used for preservation of these kidneys. After perfusion with Kollinz-3 solution, the kidneys were preserved in it at +2 to +4 degrees in the same solution. The results showed that external cooling has a protective effect on these kidneys, favoring somewhat the kidneys of the newborn ones over those of the small children donors. This method makes it possible to preserve glomerular filtration, reabsorptional and diuretic ability of newborn kidneys almost unaltered. Figures 1; references 10: 7 Russian, 3 Western.

7813/9835  
CSO: 1840/711

## BURN CENTER IN MOSCOW

Moscow GOLOS RODINY in Russian 13 Apr 87 p 4

[Article by V. Safonov, titled "Each Call--An Emergency"]

[Abstract] After required first aid, the physician can refer a burn patient to Moscow for further treatment. Annually 800 cases are accepted at the Center of Surgery imeni A.V. Vishnevskiy which was organized about 20 years ago. In this time it has undergone many changes, mostly improving the professional status of the staff. At present, the attention is given to dressing treatment methods: how to treat a patient in the fastest and most effective manner. An aerotherapeutic unit newly developed is used: purified, heated air is passed over a patient placed in a polystyrene tent. Some of these isolators are designed for just portions of the body (arms, legs). Another innovation is the enteral feeding apparatus: tube feeding provides precise dosage of nutrition at proper times. Air pillows represent another innovation for treatment of burn cases: patients feel as if they were suspended in air. And the pure atmosphere aids in healing processes. An anecdotal case history is reported disproving the formula of "age + %-burn exceeding 100" as being determinant for possible cure.

7813/9835

CSO: 1840/704

UDC 615.384.03.07

## PATHOPHYSIOLOGICAL RATIONALE FOR HEMODYNAMIC EFFICACY OF BLOOD SUBSTITUTES

Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA in Russian No 6, Nov-Dec 86 (manuscript received 22 Jan 86) pp 49-53

[Article by G.S. Levin, S.A. Sultanov and S.V. Kostova, Pathophysiological Laboratory, Scientific Research Institute of Hematology and Blood Transfusion, Uzbek SSR Ministry of Health, Tashkent]

[Abstract] Chinchilla rabbits and outbred dogs were used to assess the effects of 1,4-naphthoquinone, as an electron acceptor, in the management of blood loss in conjunction with blood substitutes. Extensive cardiovascular and hemodynamic monitoring demonstrated that in rabbits with hemorrhagic shock, and in dogs with significant blood loss, administration of a combination of Rheopolyglucin (20 ml/kg) and 1,4-naphthoquinone (0.8 mg/kg in rabbits; 0.2 mg/kg in dogs) had beneficial effects on survival and normalized a number of parameters of interest or prevented further deterioration. In addition, perfusion studies on isolated guinea pig heart preparations exposed to rotenone, antimycin A, or cyanide provided additional demonstration that 1,4-naphthoquinone was effective in restoring myocardial contractility. The greater efficacy of the Rheopolyglucin + 1,4-naphthoquinone combination was

attributed to the latter's beneficial effect on myocardial electron transfer and, in turn, contractility. Figures 1; references 10: 9 Russian, 1 Western.

12172/9835  
CSO: 1840/788

UDC 582.26:581.132.4

PHOTOSYNTHETIC ACTIVITY OF EUGLENA GRACILIS KLEBS, CULTURE STRAIN UA-4-17

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 1, Jan-Feb 87  
(manuscript received 27 May 85) pp 26-28

[Article by Kh.A. Berdykulov and D.A. Nuriyeva, Institute of Microbiology,  
UzSSR Academy of Sciences]

[Abstract] Data on mass cultivation of Euglena cultures are scarce and none exist for the Uzbekistan situation. Photosynthetic activity of Euglena was studied as a function of illumination and age. The experimental strain UA-4-17 was isolated from effluent channel on a poultry farm in Tashkent in 1981. It was grown on modified Gromov medium at 23-27°C. The results showed that photosynthetic pigment content depended on the illumination and "age" of the Euglena. Maximum generation of oxygen was observed during the first 2-3 days of cultivation. During the later period, this activity diminished substantially. These data have theoretical and practical value in developing massive cultivation of Euglena. References 8: 6 Russian, 2 Western.

7813/9835  
CSO: 1840/829

UDC 616.94:579.861.2]-092.9-07

STUDY OF EXPERIMENTAL STAPHYLOCOCCAL SEPSIS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 100,  
No 10, Oct 85 (manuscript received 21 Mar 85) pp 504-506

[Article by L.L. Shimkevich and V.G. Terplyakov, Laboratory of Clinical  
Diagnosis (Chief: L.L. Shimkevich), Institute of Surgery imeni A.V. Vishnevskiy,  
USSR Academy of Medical Sciences; Division of Hyperbaric Oxygenation (Director:  
S.N. Yefuni), All Union Scientific Center of Surgery, USSR Academy of Medical  
Sciences, Moscow]

[Abstract] An animal model for sepsis was developed. Infection in rats was evoked by injection of Staphylococcus aureus culture isolated from septic

patients in 10% CaCl<sub>2</sub> solution. IM injection into the rear leg was accompanied by local necrosis, depressed repair reaction, ulceration and local inflammatory process lasting 4-5 days. Some of the animals died. During the first 1 to 3 days, bacteremia developed in all animals, staphylococcal colonies were observed in slides of the spleen and, to a lesser degree, in liver and kidneys. In addition to mortality, local infection foci were developed along with bacteremia, septicemia and septicopyemia. Like in humans, rat model septicemia developed through several days. Mortality came at different times and stages, the lethality being higher among the younger animals. Figures 1; references 5: 4 Russian, 1 Western.

7813/9835  
CSO: 1840/1125

UDC 579.843.1:[579.61:616.9-022.1]:577.2

#### DETERMINATION OF NAG-VIBRIO VIRULENCE BY COMPLEX METHOD

Moscow LABORATORNOYE DELO in Russian No 4, Apr 87 (manuscript received 17 Apr 86) pp 307-310

[Article by A.K. Menyakin, I.G. Kozhukhov, N.V. Krasnousova and N.P. Menyakina, Chimkent]

[Abstract] The goal of this study was to evaluate the virulence of NAG-vibrios circulating in the environment and phage typing of some 102 strains isolated from four Chimkent water reservoirs. Analysis of the data showed that  $36.2 \pm 4.7\%$  were TEPV phage resistant and  $63.8 \pm 4.7\%$  were lysed by them. The latter represented 5 phage types (1, 2, 4, 5, 7), 80% of them were type I phages. Phage resistant strains were found in each water reservoir but their index ranged from 23.2 to 56.2. Mouse paw edema test showed 53.4% of strains to be weakly toxic and 11.6% highly toxic. This was a higher level than that found in other water reservoirs. A high degree of correlation was noted ( $96.6 \pm 2.3\%$ ) between the determination of virulence by phage typing and the mouse paw edema test. References: 17 Russian.

7813/9835  
CSO: 1840/816



## USE OF SOLID RADIOACTIVE WASTE CTO-10-OC COLLECTOR IN CULTURING ANAEROBIC BACTERIA

Moscow LABORATORNOYE DELO in Russian No 3, Mar 87 (manuscript received 29 Dec 85) pp 179-182

[Article by Ye.P. Pashkov and A.Yu. Mironov, Department of Microbiology, First Moscow Medical Institute imeni I.M. Sechenov]

[Abstract] Soviet-produced microanaerostat MI-752 was evaluated and compared to the imported gas POC model which showed the shortcomings of the domestic equipment. An attempt was made to correct this problem by developing an inexpensive yet reliable anaerostat. A CTO-10-OC solid radioactive waste collector was modified by drilling a hole in its lid, inserting a tube through the end inserted into the collector, the other being attached to a rubber tube with Kocher's or Billroth clamp and connected to a vacuum pump and a tank with a tri-component gas mixture (80% N<sub>2</sub>, 10% H<sub>2</sub>, 10% CO<sub>2</sub>). The system was hermetically sealed for these operations. Comparative tests run parallel with gas POC had excellent results showing that this new unit could be used instead of the expensive imported one without losing any of the advantages. Figures 1; references 9: 5 Russian (1 by Western author), 4 Western.

7813/9835

CSO: 1840/815

## IMMUNOGENIC AND ADJUVANT PROPERTIES OF EXOPOLYSACCHARIDES OF SAPROTROPHIC MYCOBACTERIA

Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA. SERIYA 16: BIOLOGIYA in Russian No 1, Jan-Mar 87 (manuscript received 21 Jan 85) pp 52-56

[Article by I.V. Botvinko, I.S. Gulyayeva, N.N. Grechushkina and N.S. Yegorov]

[Abstract] Ability of exopolysaccharides, to produce humoral and cellular immune response in mice and adjuvant action of polymers, was studied. Three types of saprotrophic mycobacteria were used: Mycobacterium album, M. lacticolum and M. Salivarium. Intraperitoneal administration of exoglycones of all three types of mycobacteria did not produce any serum antibodies nor did they evoke secondary immune response. They were weakly toxic. The least toxic was M. salivarium. This polymer induced delayed-type hypersensitivity (DTH). M. album and M. lacticolum did not induce DTH. M. album exhibited dose-related adjuvant activity, M. salivarium also stimulated primary immune response but it was not dose related; M. lacticolum showed no adjuvant effect. An attempt is made to explain these properties in light of various literature data. Figures 1; references 15: 9 Russian, 6 Western (1 by Russian authors).

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CSO: 1840/817

UDC 617.54-001.45-073.755

CHARACTERISTICS OF X-RAY STUDIES OF GUNSHOT WOUNDS

Leningrad VESTNIK KHIRURGII IMENI I.I. GREKOV in Russian Vol 138, No 3, Mar 87 (manuscript received 24 Apr 86) pp 11, 95-97

[Article by A.N. Kishkovskiy, professor, and L.N. Bisenkov, B.I. Ishchenko and G.A. Bolshakov, doctors of medical sciences, Department of Roentgenology and Radiology (Chairman: A.N. Kishkovskiy), Department of Surgery No 1 for Advanced Training of Physicians (Chairman: A.P. Kolesov), Military Medical Academy imeni S.M. Kirov, Leningrad]

[Abstract] Thoraco-abdominal wounds are among the most difficult ones to treat. Frequency of diagnostic errors is high and rapid surgical intervention is necessary. Therefore it is crucial to perform proper roentgenologic examination. Three types of patients predominate in these complications: those with damaged organs of the gastric area, lung damage and those with a combination of both. The first group amounted to 42% of the cases; roentgenologic task was to determine the need for surgical help: immediate laparotomy. The second group with lung damage amounted to 11% of cases; clinically, all of them showed respiratory and cardiovascular disorders. The radiological problem in this case was straightforward. The third group represented the highest number of patients: 47%; they manifested grave respiratory and cardiovascular problems along with peritonitis, massive hemorrhages and shock. Clinical symptoms very definitely manifested thoraco-abdominal involvement. Roentgenologically, the task was to identify the state of the lungs, relegating the gastric problems to laparotomy. Whenever a suspicion existed, roentgenologic examination was to establish the degree of the damage to thoraco-abdominal area and localize the foreign bodies. References 3: 2 Russian, 1 Western.

7813/9835

CSO: 1840/812

MULTIPLE SPLINTER WOUNDING OF CHILD

Leningrad VESTNIK KHIRURGII in Russian No 5, May 86 (manuscript received 22 Apr 85) pp 108-109

[Article by A.P. Panyushkin, Department of General Surgery and Anesthesiology, Khabarovsk Order of the Labor Red Banner Medical Institute]

[Abstract] A case history was reported of a 10-year-old boy who was wounded while disassembling a bullet which exploded in his hands. Multiple splinter wounds of the chest, stomach, face and amputation of the left forearm resulted. Surgical correction with shock treatment were the first steps taken followed by transfusion of blood rheopolyglucine and gelatinol. Considerable bleeding was observed on the second day. On the third day athelectosis of the left lung was suspected which appeared to heal by the sixth day post-op. On the 11th day, stomach pains were noted resulting from intestinal blockage. Surgical correction, transfusions and symptomatic treatment followed. Nine days later the blockage recurred due to massive commisural process. Surgical correction was rather difficult but the recovery was uneventful. The patient has healed.

7813/9835  
CSO: 1840/1072

PULMONARY COMPLICATIONS OF SEVERE CRANIOCEREBRAL TRAUMA AND THEIR PREVENTION (CLINICAL-MORPHOLOGICAL ASPECTS)

Moscow VOPROSY NEYROKHIRURGII in Russian No 1, Jan-Feb 87 (manuscript received 2 Dec 85) pp 3-6

[Article by Yu.N. Shanin, V.A. Khilko, A.N. Khlunovskiy, S.M. Gerasimov and L.I. Savina, Department of Neurosurgery (Chairman: V.A. Khilko) and Pathological Physiology (Chairman: Yu.N. Shanin), Military Medical Academy imeni S.M. Kirov, Leningrad]

[Abstract] High, long-term peridural blockade (HTPB) shows a normalizing effect on pulmonary blood circulation; this was the reason that HTPB was used as a preventive and arresting method for pulmonary complications resulting from acute craniocerebral trauma (ACCT). 79 Patients with ACCT were studied: 47 with severe cranio-cerebral trauma who were treated by standard methods (control group) and 32 who were subjected to HTPB at the Th<sub>2-6</sub> level (study group). In the study group 40.7% developed pneumonia and 84.6% of them died. In the control group 59.6% developed pneumonia with 71.4% death rate. The basis for pulmonary complications in HTPB is a complex of specific

morphologic changes in lung parenchyma corresponding to structural damage in lung shock syndrome. Histological examination of the study group showed that HTPB led to a 2-3 fold reduction in the frequency of congestive hyperemia, hemorrhage into alveoli and intraalveolar edema, desquamation of alveolocytes and alveolitis. HTPB should not be performed after 24-48 hrs due to the chance of the development of immunodepression in the T-system along with possible inflammatory complications due to sympathetic blockade of the thymus. References 12: 9 Russian, 3 Western.

7813/9835

CSO: 1840/808

UDC 577.113.083

## CHANGES OF SPECTRUM OF EXTRA-CHROMOSOMAL DNAs OF SEROTYPE H-14 BACILLUS THURINGIENSIS CULTURES AS FUNCTION OF STAGE OF DEVELOPMENT

Yerevan DOKLADY AKADEMII NAUK ARMYANSKOY SSR in Russian Vol 83, No 3, 1986, pp 140-144

[Article by N.S. Ambartsumyan, V.G. Chichyan, K.O. Chilingaryan, V.Sh. Meliksetyan, Zh.I. Akopyan and E.G. Afrikyan, academician, ArSSR Academy of Sciences, Institute of Experimental Biology, ArSSR Academy of Sciences, Institute of Microbiology, ArSSR Academy of Sciences]

[Abstract] A possible variant of regulating activity of the  $\delta$ -endotoxin gene may be the increase of the dose of the gene which makes it possible to produce a greater quantity of protein necessary for formation of the parasporal crystal, in a shorter time. This was investigated by studying the spectrum of extra-chromosomal DNAs of *B. thuringiensis* subsp. *israelensis* at different stages of development of a synchronized bacteria culture. The study included two strains of serotype H-14 *B. thuringiensis* (the type strain INMIA-1125 and an original strain INMIA-477). Synchronized cultures of the strains were grown under uniform standard conditions and samples were taken after 5, 9, 13, 17 and 21 hours after beginning of development of the culture, for phase-contrast microscopic study. Vegetative cells with homogeneous content, frequently in chains of 2-3 cells, appeared in both strains after 5, 9 and 13 hours. After 17 hours, samples contained vegetative cells in the beginning of sporulation with granulated content and formation of crystals and spores occurred in some cases in strain INMIA-477. Samples taken in the 21st hour of culture development contained sporulating cells with inclusions and strain INMIA-477 contained partially precipitated spores. Rate of development of strain INMIA-477 was somewhat higher than that of INMIA-1125. Electrophoregrams of gels containing plasmid DNAs, isolated at different stages of culture development, showed that strain INMIA-1125 has the same spectrum of plasmid DNAs at all stages of development while the INMIA-477 spectrum changed. It was assumed that, during the vegetative phase of development, there occurs amplification of the plasmid carrying the  $\delta$ -endotoxin gene in plasmid INMIA-477 in the period of preparation of the cells for sporulation and synthesis of  $\delta$ -endotoxin. The observed differences in behavior of the high molecular weight plasmids correlated with the degree of toxicity of the strains.  $\delta$ -Endotoxin preparations from INMIA-477 strains were 50 times more toxic for fly larvae than INMIA-1125. Figures 1; references 18: 3 Russian, 15 Western.

2791/9835

CSO: 1840/586

## NONIONIZING RADIATION EFFECTS

UDC 577.3

### EFFECTS OF LOW-FREQUENCY MAGNETIC FIELD ON INHERENT RHYTHMICITY OF ISOLATED FROG ATRIUM

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 6, Nov-Dec 86 (manuscript received 15 Oct 84) pp 947-950

[Article by A.S. Kolokolov, T.Sh. Kshutashvili, A.V. Lazarev, O.V. Nakipova and A.N. Kuznetsov, Institute of Chemical Physics, USSR Academy of Sciences, Moscow]

[Abstract] Isolated frog (*Rana ridibunda*) atrial preparations were investigated for the effects of weak ( $1.5 \times 10^{-2}$  mT), low-intensity (40 Hz) magnetic fields on inherent rhythm patterns. The studies conducted for 30 min at 20°C demonstrated variable effects, usually consisting of an increase in contractility, transforming the rhythm pattern into bundles of 5 or more contractions interspersed with short resting periods. The latter were equivalent to essentially one or two beats in duration. In some cases termination of exposure to the magnetic field was followed by restoration of the normal rhythm pattern for the preparation, while in others contractile activity ceased. These observations demonstrated that low-intensity, weak magnetic fields destabilize the mechanisms responsible for inherent rhythmicity of the frog atria. Although the mechanism of action of the magnetic field has not been elucidated, the changes resembled alterations that sometimes are seen to occur spontaneously. Figures 2; references 5: 3 Russian, 2 Western.

12172/9835

CSO: 1840/674

EFFECTS OF PERMANENT MAGNETIC FIELDS ON CNS STRUCTURE

Moscow BYULLETen EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 11, Nov 86 (manuscript received 13 Jan 86) pp 600-602

[Article by M.S. Abdullakhodzdayeva and S.R. Razykov, Chair of Pathologic Anatomy, Tashkent Medical Institute]

[Abstract] The effects of short-term and long-term exposure to permanent magnetic fields (PMF) on the ultrastructure of the pre- and postcentral cerebral cortex were investigated in outbred male rats (200-250 g). The animals were exposed to 50 mTl PMF for 1 h/day for 1 to 30 days. Up to 15 exposures to PMF elicited transient changes indicative of compensation and adaptation, whereas with 30 exposures frankly-dystrophic changes were evident. In general, the astrocytes responded after changes were evident in the neurons, but the ultrastructural alterations in the astrocytes tended to be more pronounced. Ten days after exposures were discontinued, regenerative changes were noted in the neurons, astrocytes and the synaptic structures. Figures 3; references: 9 Russian.

12172/9835

CSO: 1840/734

UDC 612.351.11:577.152.1+612.351.1:612.397.2].014.46:678.746.47

ACTIVITY OF MONOOXYGENASE SYSTEM AND RATE OF PEROXIDATION OF LIPIDS IN RAT LIVER MICROSOMES DURING REINDUCTION WITH POLYCHLORINATED DIPHENYLS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian No 1, Jan 86 (manuscript received 28 Dec 84) pp 38-40

[Article by V.A. Tutelyan, A.V. Khan, N.V. Lashneva, G.K. Sorokovaya and Z.M. Gadzhiyeva, Laboratory of Nutrition Enzymology (Chief: V.A. Tutelyan), Institute of Nutrition, USSR Academy of Medical Sciences, Moscow]

[Abstract] Functional state of monooxygenase system (MOS) and the rate of peroxidase oxidation of lipids (POL) in rat liver microsomes was studied during repetitive administration of polychlorinated diphenyls (PCD: domestic product sovol was actually used). It was shown that a single administration of sovol led to a lasting effect on rat liver MOS, comparable to the effect of phenobarbital and methylcholanthrene. This was due to accumulation of sovol in the tissue coupled with slow elimination. Repeated administration of sovol gave a similar response. Morphological changes in liver were similar in both the initial and repetitive dosage, except for the degree of fat infiltration, its distribution and the size of nuclei. The rate of POL in liver microsomes increased 1.4-1.5 fold in the experimental animals. Figures 1; references 15: 8 Russian, 7 Western.

7813/9835  
CSO: 1840/1117



UDC 612.89.014.467:615.31:[547.95:547.943

PARTICIPATION OF MU- AND DELTA-OPIATE RECEPTORS IN REALIZATION OF VEGETATIVE RESPONSES TO OPIOID PEPTIDES

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian No 1, Jan 86 (manuscript received 26 Feb 85) pp 60-63

[Article by Ye.R. Martynova and O.S. Medvedev, Laboratory of Experimental Pharmacology (Chief: O.S. Medvedev), Institute of Experimental Cardiology, All Union Scientific Cardilogic Center, USSR Academy of Medical Sciences, Moscow]

[Abstract] To elucidate the mechanism of cardiovascular action of opioid peptides, the effect of selective agonists of mu- and delta-opiate receptors was studied by their manifestation of hemodynamic indices and respiratory functions. The ability of a number of synthetic analogs of encephalins was studied in their activation of opiate receptors. Experiments were performed on isolated mouse vas deferens (containing principally delta-receptors) and guinea pig ileum (mainly mu-receptors). All of the peptides used showed agonistic activity in respect to mu- and delta-opiate receptors. Among them [DAla<sup>2</sup>DLeu<sup>5</sup>]-encephalin (DADLE) was selectively active against the delta-receptor, while [DAla<sup>2</sup>,MePhe<sup>4</sup>,Gly<sup>5</sup>-ol]-encephalin (DAMPGE) exhibited agonistic action to Mu-receptor. In another experiment on urethane anesthetized rats, administration of either DADLE or DAMPGE ( $10^{-7}$  M/kg) led to hypotension, bradycardia and expiratory apnoe. These effects disappeared after injection of naloxone or bilateral cervical vagotomy. It was concluded that the above effects are reflex in nature; their physiological meaning remains unclear. Figures 2; references 13: 1 Russian, 12 Western.

7813/9835

CSO: 1840/1117

UDC 616.379-091.817-07:616.153.962.4-097:616.379-018.1]-078.73

IMMUNOENZYMATIC DETERMINATION OF ANTIBODIES TO ISLET CELL SURFACE OF PANCREAS DURING AUTOIMMUNE DESTRUCTION OF INSULARY APPARATUS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian No 1, Jan 86 (manuscript received 15 Mar 85) pp 63-65

[Article by Ya.Yu. Kondratyev, N.V. Sadovnikova, V.P. Fedotov and A.L. Liozner, Laboratory of Biological Standardization of Hormones (Chief: V.P. Fedotov) Institute of Experimental Endocrinology and Hormonal Chemistry, USSR Academy of Sciences; Laboratory of Immunoenzymatic Analysis (Chief: A.L. Liozner) Institute of Immunology, USSR Ministry of Health, Moscow]

[Abstract] Enzyme-linked immunosorbent assay (ELISA) was used to screen the islet cell surface antibodies (ICSA); a group of patients with high risk of

developing diabetes was evaluated in a preliminary fashion. There were 68 individuals in four groups; controls consisting of randomly-selected, apparently healthy individuals with no family history of diabetes; their values were used to determine the upper limit for the normal readings. First study group consisted of insulin-dependent diabetes patients with a history of at least five years; 11 of the 18 individuals in this group were ICSEA positive. The second study group (9 insulin-independent diabetics) showed negative results in each case. The third group of healthy individuals related to insulin independent patients had three positive and 15 negative readings. Thus it was shown that ELISA test could be used for screening of patients with different types of diabetes and even in detection of high-risk individuals. Figures 2; references 13: 1 Russian, 12 Western.

7813/9835  
CSO: 1840/1117

UDC 616.311-018.73-091,8-02:613.632:546.18]-092.9

#### MORPHOLOGY OF ORAL MUCOSA IN RATS KEPT UNDER CONDITIONS OF INCREASED PHOSPHORUS CONTENT

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian No 1, Jan 86 (manuscript received 24 Jun 85) pp 109-112

[Article by S.R. Ruzuddinov and M. Rys-Uly, Chair of Orthopedic Stomatology (Chairman A.A. Sedunov), Chair of Histology (Chairman: A.S. Tolybekov), Alma-Ata Medical Institute]

[Abstract] The goal of this study was to investigate morphology of rat oral mucosa in animals maintained under conditions of prolonged production of phosphorus. For the first month there were no morphological changes observed. Starting with the second month, thickening of epithelial layer was noted in mucosa of the gums, jaws, palate and tongue along with massive hyperkeratosis. These changes continued to progress during the third and fourth months except that in the latter period atrophic process began to set in. Connective tissue of submucous base exhibited microcirculatory disorders and dystrophic changes of the blood vessel walls, especially pronounced towards the end of the experiment. These changes were viewed as direct local effect of elemental phosphorus and its inorganic compounds on the structure of oral mucosa. Figures 3; references 4: 3 Russian, 1 Western.

7813/9835  
CSO: 1840/1117

EFFECTS OF DES-9-GLYCINE-(8-ARGININE)-VASOPRESSIN ON EVOKED PRIMARY  
RESPONSE OF VARIOUS BRAIN FORMATIONS IN RABBITS

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 33, No 1, Jan-Feb 87  
(manuscript received 29 May 86) pp 26-31

[Article by O.S. Papsuyevich, V.D. Bakharev and G.I. Chipens, Institute of  
Organic Synthesis, Latvian SSR Academy of Sciences, Riga]

[Abstract] A study was conducted on the responsiveness of the various brain  
formations in chinchilla rabbits to i.v. injection of des-9-glycine-  
(8-arginine)-vasopressin, analyzed in terms of evoked potentials to photo-  
and phonostimuli. The electrophysiological studies demonstrated that all of  
the structures tested were responsive to 20 µg/kg of the peptide; however, the  
hypothalamus and the hippocampus showed particular sensitivity in terms of  
the evoked potential. Both formations were also much more responsive to a  
graded increase in the dosage of the peptide. Polymodality of the synthetic  
analog of vasopressin were also evident in the fact that the optic system  
was much more sensitive than the auditory system. References 13:  
7 Russian, 6 Western.

12172/9835  
CSO: 1840/778

UDC 612.821+612.833.81].014.46:615.357.814.32:577.175.325

CATECHOLAMINERGIC COMPONENT IN ACTION OF HEPTAPEPTIDE ANALOG OF ACTH<sub>4-10</sub>  
IN OPEN-FIELD BEHAVIOR OF RATS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,  
No 11, Nov 86 (manuscript received 13 Dec 85) pp 569-571

[Article by L.V. Antonova, A.A. Kamenskiy, T.I. Vlasova, N.Yu. Sarycheva,  
V.N. Nezavibatko, M.A. Ponomareva-Stepnaya, A.Yu. Shemanov and K.S. Rayevskiy,  
Institute of Molecular Genetics, USSR Academy of Sciences; Moscow State  
University; Institute of Pharmacology, USSR Academy of Medical Sciences,  
Moscow]

[Abstract] Outbred male rats were employed in an evaluation of the behavioral  
consequences of intraperitoneal administration of 0.015 mg/kg heptapeptide  
MEHFPGP, and ACTH<sub>4-10</sub> analog. Using a series of open-field observations,  
the data led to the conclusion that MEHFPGP abolished amphetamine-induced  
exploratory and grooming behavior. Repetition 7 days later demonstrated that  
haloperidol and apomorphine interfered with normal extinction of the  
orienting reaction by facilitating it. Administration of MEHFPGP corrected  
the effects of haloperidol and apomorphine. The heptapeptide had no  
effect on forebrain levels of biogenic amines, diminishing the rate of tyrosine

hydroxylation in a concentration of  $10^{-4}$  M in striatal and hypothalamic synaptosomes. The observations were interpreted to indicate a catecholaminergic component in the action of MEHFFGP, although the neurochemical mechanism of action remains to be determined. References 10: 4 Russian, 6 Western.

12172/9835

CSO: 1840/734

UDC 615.373.6.014.62:615.385.1].033.018.61

# TARGETED DELIVERY OF ERYTHROCYTES TO HUMAN AORTIC SMOOTH MUSCLE IN VITRO

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 11, Nov 86 (manuscript received 26 Dec 85) pp 571-573

[Article by M.A. Glukhova, S.P. Domogatskiy, A.Ye. Kabakov, V.R. Muzykantov, O.I. Ornatskaya, D.V. Sakharov and M.G. Frid, Institute of Experimental Cardiology, All-Union Cardiological Scientific Center, USSR Academy of Medical Sciences, Moscow]

[Abstract] Tissue-culture studies were conducted on the delivery of erythrocytes--potential drug vehicles--to human aortic smooth muscle cells in tissue culture. Tissue-cultures of the smooth muscles, endothelial cell, and a mixed culture of both types of cells were treated with monoclonal antibody against the myocytes, thereby demonstrating the specific binding of the antibody to the myocytes. In a subsequent step, the monoclonal antibody-treated cultures were overlaid with erythrocytes conjugated with rabbit antibody against mouse immunoglobulins. The erythrocytes were found to bind specifically to the myocytes, indicating the potential usefulness of this approach in delivering drug-loaded erythrocytes to aortic myocytes. Figures 3; references: 13 Western.

12172/9835

CSO: 1840/734

UDC 612.017.1.014.46:615.31:547.944.3].015.2:615.31:547.96

IMMUNOLOGICAL AND PHARMACOLOGICAL ACTIVITIES OF PROTEIN CONJUGATES OF ATROPINE

Moscow BYULLETen EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 11, Nov 86 (manuscript received 28 Aug 85) pp 580-583

[Article by V.K. Kozlov and A.Ya. Beshpalov, Departments of Pharmacology and of Chemistry, Institute of Toxicology, USSR Ministry of Health, Leningrad]

[Abstract] Mice and rabbits were employed in a study designed to evaluate the immunogenicity of atropine-BSA conjugates and the pharmacologic (cholinolytic) activity of such conjugates. The conjugates lacked toxicity in doses as high as 100 mg/kg, showing maximum immunogenicity in doses of 5-10 mg/kg, eliciting both the IgM and IgG responses. The antibodies were specific for the atropine hapten. Administration of 25 mg/kg conjugate resulted in peripheral cholinolytic effects. Central cholinolytic effects were lacking due to the large size of the conjugate (greater than 70,000D) and its failure to penetrate the blood-brain barrier. Figures 2; references 13: 8 Russian, 5 Western.

12172/9835

CSO: 1840/734

UDC 612.273.2.014.49.014.46:615.212.7:547.943

INFLUENCE OF AGONISTS AND ANTAGONISTS OF OPIATE RECEPTORS ON RESISTANCE OF ANIMALS TO HYPOXIC HYPOXIA

Moscow BYULLETen EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 98, No 12, Dec 84 (manuscript received 16 Mar 84) pp 680-682

[Article by V.V. Zakusov, V.V. Yasnetsov, R.U. Ostrovskaya, V.V. Chukayev, V.G. Motin and V.A. Pravdivtsev, Scientific Research Institute of Pharmacology, USSR Academy of Medical Sciences; Scientific Research Institute of Normal Physiology imeni P.K. Anokhin, USSR Academy of Medical Sciences, Moscow]

[Abstract] A comparative study was performed of the influence of both agonists and antagonists of opiate receptors on the resistance of animals to hypoxic hypoxia. The agonists used were morphine and synthetic analogs of endogenous enkephalins. Antagonists included naloxon and nalorphin plus thyroliberin. Experiments were performed on male CBA mice, cats and rabbits exposed to normobaric hypoxia achieved by displacement of a portion of the O<sub>2</sub> with nitrogen, initial O<sub>2</sub> content 8 vol. %. CO<sub>2</sub> was absorbed during the experiments. Morphine and several of the synthetic enkephalin analogs increased the survival time of the animals. This effect was blocked by naloxon, indicating mediation of the effect through an interaction with the opiate receptors. Bicuculline antagonism was observed, indicating possible GABAergic modulation of this interaction. The opiate receptors and their

endogenous ligands, opiate peptides, are thus involved in defense reactions of the organism under the extreme conditions modeled in the experiment. Figures 1; references 11: 6 Russian, 5 Western,

6508/9835

CSO: 1840/728

UDC 612.419.018:577,175,82]-08:612.884

INFLUENCE OF BONE MARROW MEDIATOR MYELOPEPTIDES ON SUMMATION-THRESHOLD INDEX AND BEHAVIOR REACTIONS OF RATS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 98, No 12, Dec 84 (manuscript received 16 Feb 84) pp 696-698

[Article by A.M. Vasilenko, G.N. Barashkov and L.A. Zakharova, Central Scientific Research Institute of Reflex Therapy; Institute of Immunology, USSR Ministry of Health, Moscow]

[Abstract] A study is presented of the analgesic effect of myelopeptides, based on their influence on the summation-threshold index and behavioral reaction of rats in an "open field" experiment, 30-40 minutes after administration of the myelopeptides or saline solution. Experiments were performed in an area with no other distractions, at the same time each day, by a double-blind method. Raw data were processed by variation statistics methods. The results indicated that myelopeptides can block the transmission of nociceptive signals at the spinal and trunk levels. In spite of the marked analgesic properties, the myelopeptides did not influence behavioral reactions regulated by the cerebral hemispheres, distinguishing them from known narcotic analgesics and most endorphin-like substances. The analgesic and immunostimulating effects of myelopeptides with no apparent influence on behavioral reactions makes them quite promising for clinical use. Figures 2; references 12: 10 Russian, 2 Western.

6508/9835

CSO: 1840/728

ELECTROPHYSIOLOGICAL AND BIOCHEMICAL MECHANISMS OF ANTICONVULSIVE EFFECT OF  
3-HYDROXYPYRIDINE CLASS ANTIOXIDANT

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102,  
No 12, Dec 86 (manuscript received 10 Feb 86) pp 663-665

[Article by L.N. Nerobkova, T.A. Voronina, A.N. Aliyev, L.D. Smirnov,  
G.N. Kryzhanovskiy, V.Ye. Braslavskiy and Ye.V. Nikushkin, Institute of  
Pharmacology, USSR Academy of Medical Sciences and Institute of General  
Pathology and Pathologic Physiology, USSR Academy of Medical Sciences, Moscow]

[Abstract] The mechanism of the anticonvulsive effect of antioxidants is unknown. This article studies the mechanisms of the anticonvulsive effect of 3 hydroxypyridine derivatives, which have a broad spectrum of psychotropic effects including anxiolytic, antistress and antihypoxic effects, in their electrophysiological and biochemical aspects. Studies were performed on male white rats following i/m administration of bemigril to produce epileptiform activity. The bioelectrical activity of the sensomotor area of the cortex, the dorsal hippocampus and lateral hypothalamus was studied. The animals were divided into three groups: In the first, the 3-hydroxypyridine derivative was administered at 50 mg/kg 15 minutes after bemigril 10 mg/kg; in the second, the 3-hydroxypyridine derivative was administered in the same dose 30-40 minutes before injection of bemigril; in the third, or control group, bemigril alone was administered. The effect of 3-hydroxypyridine on peroxidation of lipids was also studied. Administration of 3-hydroxypyridine with generalized epileptiform activity already present caused significant reduction in paroxysmal activity in all structures studied. Prophylactic administration prevented development of epileptiform activity and normalized peroxidation of lipids. The results indicate that the hippocampus is the determinant structure in the development of generalized epileptiform activity. Figures 3; references: 8 Russian.

6508/9835

CSO: 1840/736

NEW ASPECTS OF NEUROPHYSIOLOGICAL MECHANISM OF ACTION OF NOOTROPIC DRUGS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 12, Dec 86 (manuscript received 10 Feb 86) pp 721-724

[Article by T.A. Voronina and S.V. Krapivin, Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow]

[Abstract] Fourier spectral analysis of EEG of the cortex and hippocampus of rats was used to study possible neurophysiological mechanisms of action of neurotropic drugs. Experiments were performed on 29 unrestrained male rats. EEG were recorded for 5 minutes before administration of the drug and each 30 minutes for 3-4 hours after injection. Administration of pyracetam resulted in stabilization and an increase in the dominant peak of the EEG by  $22.79 \pm 4.79\%$  with a simultaneous drop in the power of the spectrum on either side of the peak frequency. Pyritinol had a similar effect, with its maximum occurring 2 1/2 to 3 hours after administration rather than 1 1/2 to 2 hours with pyracetam. 3-Hydroxypyridine caused a similar change with a maximum at 2-2 1/2 hours in the cortex, 1-1 1/2 hours in the hippocampus. The neurophysiological mechanism of action of the nootropic preparations is thus probably optimal improvement of the organization of rhythmic activity of the brain, with an increase in the level of spatial synchronization of bioelectric oscillations of the cerebral cortex. Figures 2; references 13: 6 Russian, 7 Western.

6508/9835

CSO: 1840/736

UDC 615.31:547.823].015.4:[612.111.7+612.111.7.0152

CHANGE IN LEVEL OF CYCLIC NUCLEOTIDES AND INHIBITION OF HUMAN THROMBOCYTE AGGREGATION UPON EXPOSURE TO 3-HYDROXYPYRIDINES

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 10, Oct 86 (manuscript received 2 Jul 85) pp 432-434

[Article by K.O. Muranov, N.B. Polyanskiy, A.A. Shvedova, V.Ye. Kagan, and L.D. Smirnov, Laboratory of Radiobiology, Institute of Chemical Physics, USSR Academy of Sciences, Moscow; Institute of Physiology, Bulgarian Academy of Sciences, Sofia; Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow]

[Abstract] Emoxipin, a 3-hydroxypyridine preparation, is successfully used in clinical practice as a means for treatment of intraocular hemorrhages of vascular genesis. It has been suggested that one mechanism of action of emoxipin is inhibition of the aggregation of thromobocytes by suppression of phosphodiesterase activity and increasing the intracellular concentration of cyclic nucleotides. The present work is a study of the effect of a number



of 3-hydroxypyridine derivatives on the level of cyclic nucleotides in thrombocytes and on their aggregation. The substances studied can be divided into three groups with varying capability to inhibit aggregation of thrombocytes. The effect of 3-hydroxypyridine derivatives on aggregation of thrombocytes is not related to a single mechanism of phosphodiesterase activity inhibition and increased content of intracellular cAMP.

References 6: 3 Russian, 3 Western.

6508/9835

CSO: 1840/733

UDC 615.277.3:546.92].099:616.61].015.25

#### PHARMACOLOGICAL BLOCKAGE OF CIS-PLATINUM NEPHROTOXICITY IN RATS

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 10, Oct 86 (manuscript received 27 Aug 84) pp 442-445

[Article by Yu.V. Natochin, I.V. Reznik, V.T. Bakhteyeva, V.B. Ivanov and Ye.M. Myazina, Laboratory of Evolution of the Kidney and Water-Salt Metabolism (Headed by Professor Yu.V. Natochin), Institute of Evolutionary Physiology and Biochemistry imeni I.M. Sechenov, USSR Academy of Sciences, Leningrad]

[Abstract] Cis-platinum, used in the treatment of malignant tumors, frequently causes kidney function disorder, severe damage to proximal nephron tubules and renal insufficiency after entering the cells of tubules capable of secreting organic substances. Pharmacological screening of the secretory apparatus during the maximum of cis-platinum excretion could prevent renal insufficiency. This thesis is tested in experiments on white rats which received cis-platinum 0.5 mg per 100 g body mass i/v. Administration of furosemide before or within 3 hours after administration of cis-platinum reduced the rise in blood serum urea concentration. Comparative testing with another diuretic indicated that the protective effect of furosemide resulted from its secretion in the proximal tubule, competitively decreasing entry of cis-platinum into the tubule, rather than an increase in diuresis. Figures 2; references 7: 2 Russian, 5 Western.

6508/9835

CSO: 1840/733

## TOXICOLOGIC CHARACTERISTICS OF CYCLOPHOS

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 11,  
Nov 86 (manuscript received 5 Mar 86) pp 52-53

[Article by Ye.A. Yershova and P.G. Zhminko, All-Union Scientific Research  
Institute of Hygiene and Toxicology of Pesticides, Polymers and Plastics,  
Kiev]

[Abstract] Cyclophos is a Soviet organophosphorus insecticide. Its toxicity was studied by administering it intragastrically, onto the skin and by inhalation. The LD<sub>50</sub> for white mice, rats and guinea pigs was calculated as 630-690 mg/kg for intragastric administration. The substance did not cause irritation of the skin or ophthalmic mucosa and had no expressed resorptive effect. The LD<sub>50</sub> for application to the skin was 1025 mg/kg. Repeated application over 20 days of 51.2 mg/kg to the skin caused a decrease in cholinesterase activity of erythrocytes, blood serum and liver. Cyclophos thus has moderate toxicity with some skin-resorptive effect and no irritant effect. The cumulation factor is over 5. It is a class two substance, and must be labeled "exposure on undamaged skin is dangerous".  
References 6: 5 Russian, 1 Western.

6508/9835

CSO: 1840/718

UDC 615.282.033/.034+613.632:615.282.033/.034

## TOXICOKINETICS OF RICID-P IN HOMOIOTHERMS

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 11,  
Nov 86 (manuscript received 22 Mar 86) pp 53-54

[Article by D.A. Chura, A.K. Manenko and V.P. Drobyazko, Medicinal  
Institute, Lvov]

[Abstract] Ricid-P is used in agriculture for control of rice periculariosis and thus is a danger for acute alimentary, inhalation and percutaneous intoxication. Experiments were performed on 80 white rats of both sexes by one-time enteral administration at 53 mg/kg (1/10 LD<sub>50</sub>). Various internal organ tissues, blood, urine and feces were studied 1, 3, 24, 72 and 96 hours after administration of the substance by thin-layer chromatography with extraction of the substance from the tissues with n-hexane, purification of the extract with concentrated sulfuric acid, washing the extract with a saturated solution of anhydrous sodium sulfate in concentrated sulfuric acid, drying with anhydrous sodium sulfate and chromatography on a thin layer of silica gel. The total quantity of the substance determined in the various organs, urine and feces represented only 48.1% of that

administered, and no metabolites were found, indicating that most of the ricid-p was firmly bonded to various tissue components in the body. Three hours after administration it was found in the heart, liver, spleen, lungs, kidneys, fatty tissue and intestinal walls. No selective accumulation of ricid-p was found in the organs of the experimental animals. The half-life of the substance in the body was 48 hours. References: 2 Russian.

6508/9835  
CSO: 1840/718

UDC 517.352.5:612.822

#### INFLUENCE OF LAPPACONITINE ON SODIUM CONDUCTIVITY OF EXCITABLE FORMATIONS

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 5, Sep-Oct 86  
(manuscript received 5 Nov 85) pp 7-10

[Article by F.N. Dzhakhangirov, A.Ye. Valeyev and F.S. Sadritdinov, Order of Labor Red Banner Institute of Plant Substance Chemistry, Uzbek SSR Academy of Sciences]

[Abstract] The alkaloid lappaconitine is shown to have a depressant influence on the calcium entry channel through a somatic membrane. A decrease was observed in the potassium exit channel, with no effect on the sodium entry channel. The related neurotoxin aconitine also causes no significant change in ionic conductivity of the sodium channels of mollusk neurons. Experiments were performed on isolated nerve cells as well as on alert rats and mice, studying the influence of lappaconitine on the fast sodium channel of isolated cells with intracellular perfusion and recording of the membrane potential. The ability of the preparation to antagonize characteristic symptoms of nerve poisoning by aconitine and veratrine was studied in the experiments on alert animals. The influence of lappaconitine on the arrhythmogenic effect of aconitine was studied in a separate series of experiments on male rats. The influence of preliminary intraperitoneal administration of lappaconitine on the course and outcome of nerve poisoning by i/v administration of an absolutely-lethal dose of aconitine and veratrine was studied on 115 alert mice. Lappaconitine manifested a clear antagonism to the effects of aconitine and veratrine, 0.05-0.25 mg/kg preventing the arrhythmogenic effect of aconitine in 60-100% of rats. Intraperitoneal administration of 0.5-1.5 mg/kg lappaconitine reliably decreased the onset of nerve poisoning symptoms and prevented cardiac fibrillation and death in 30-100% of mice. Figures 3; references 11: 2 Russian, 9 Western.

6508/9835  
CSO: 1840/681

## SYNTHESIS OF 1-(3-HALOTETRAHYDROFURYL-2)-URACYL DERIVATIVES OF 5-SUBSTITUTED URACYLS AND CYTOSINE

Riga KHIMIYA GETEROTSIKLICHESKIKH SOYEDINENIY in Russian No 1, Jan 87  
(manuscript received 12 Jun 86) pp 94-99

[Article by L.T. Kaulinya and M.Yu. Lidak, Institute of Organic Synthesis  
LaSSR Academy of Sciences, Riga]

[Abstract] Some of the halogen-containing nucleoside analogs exhibit antitumor and antiviral properties. An attempt was made to synthesize ftorafur derivatives with chlorine and bromine in the 3 position of the tetrahydrofurane ring. Introduction of a halogen increases lyophilic properties of an agent altering the ability to penetrate cell membranes. Alkylation of 2,4-bis-trimethylsilyl derivatives of uracyl, 5-substituted uracyls and cytosine with 2,3-dihalotetrahydrofuranes gave cis- and trans isomers of their 1-(3-halo-tetrahydrofuryl-2)-derivatives. Physical-chemical properties of these compounds are reported. Antitumor activity was evaluated on two transplantable models: L 1210 leukemia and adenocarcinoma 755 for the cis isomer of 1-(3-chloro-(bromo)-tetrahydrofuryl-2)-5-fluorouracyl. The chloroderivative increased the survival of animals with L 1210 by 64% and retarded the growth of AC 755 by 38%, while the bromo-derivative did so to the extent of 45 and 25% respectively. Thus it was shown that these new derivatives exhibited antitumor activity comparable to that of ftorafur but did not exceed it. Figures 1; references 14: 6 Russian, 8 Western.

7813/9835  
CSO: 1840/837

UDC 631.811

## BIOLOGY OF FUSICOCCINE PRODUCER FUNGUS FUSICOCCUM AMYGDALI

Moscow DOKLADY VSESOYUZNOY ORDENA LENINA I ORDENA TRUDOVOGO KRASNOGO  
ZNAMENI AKADEMII SELSKOKHOZYAYSTVENNYKH NAUK IMENI V.I. LENINA in Russian  
No 3, Mar 86 pp 37-38

[Article by K.A. Abbasova, R.A. Maksimova, T.S. Sharkova, N.P. Palmova and  
A.N. Polin, Moscow State Order of Lenin, Order of the Labor Red Banner and  
Order of October Revolution University imeni M.V. Lomonosov]

[Abstract] Fusicoccine is one of the more interesting regulators of plant growth because of its high multifaceted biological activity. The goal of the present work was to study the biology of its producer, the fungus Fusicoccum amygdali, and the breeding of individual strains. The fungus was grown on agar in Chapek medium at 24-26°C. Under such conditions

F. amygdali produced white mycelium (scabby and flocculent, air or substrate) with uniform or zonal growth and no spore formation. Morphological properties of this fungus were modified during passage. A bank of F. amygdali monocultures was obtained characterized by increased ability to synthesize fusiccoccine and relative morphological stability. References 8: 3 Russian, 5 Western.

7813/9835

CSO: 1840/1078

UDC 613.63-092.4/.9:547.52/59:678.4

#### TOXICOLOGY OF META- AND PARA-DIHYDROXYDIAZOPROPYLBENZENES

Baku AZERBAYDZHANSKIY MEDITSINSKIY ZHURNAL in Russian No 8, Aug 86 pp 57-61

[Article by V.G. Guseynov, Azerbaijan Scientific Research Institute of Labor Hygiene and Occupational Diseases imeni M.M. Efendizade (Director I.I. Alekperov)]

[Abstract] Meta- and para-dihydroxydiazopropylbenzenes are obtained as byproducts during synthesis of resorcinol and hydroquinone. They are used in synthesis of isopropylmethylstyrene and diisopropylbenzene. Earlier studies showed them to be weakly toxic and not dangerous compounds. In the present paper acute and subacute toxicity of these compounds are reported on white rats, mice, guinea pigs and rabbits, administering the agents ip, cutaneously, on the eye membrane and by inhalation. Clinical behavior after exposure to lethal doses is described. Skin, eye membrane and inhalation experiments did not show any serious damage to the experimental animals. Overall, the agents are considered to be of low toxicity but individuals working with them should wear protective masks and goggles.

7813/9835

CSO: 1840/1113

REGRESSION ANALYSIS OF CLINICAL DATA FOR PROGNOSIS OF PSYCHOPHARMACOTHERAPY  
EFFECTIVENESS FOR SCHIZOPHRENIA ATTACKS

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII in Russian Vol 86, No 1, Jan 86  
(manuscript received 7 Mar 84) pp 91-97

[Article by S.G. Zaytsev, V.V. Kalinin and T.I. Golikova, Division of  
Psychosis Therapy (Director: G.Ya. Avrutskiy), Moscow Scientific Research  
Institute of Psychiatry (Director: V.V. Kovalev), RSFSR Ministry of Public  
Health, Laboratory of Mathematical Theory of Experimentation (Chief:  
V.V. Nalimov), Department of Biology, Moscow University imeni M.V. Lomonosov]

[Abstract] The goal of this work was to investigate the ability to predict  
schizophrenic attacks under conditions of predetermined psychopharmaceutical  
therapy based on analysis of the psychological state of the patients. In this  
study 60 patients were entered: 45 in the experimental group and 15 controls.  
Patients were treated by "antidelusion" and antidepressant drugs on  
individualized basis. Pretreatment ratings of 78 psychopathological symptoms  
were analyzed by stepwise regression analysis leading to 15 predictors  
(8 of them positive and 7 negative) which were then used in an equation. The  
power of prediction was tested on another group of patients, showing a  
satisfactory agreement ( $r = 0.87$ ). Methodological problems faced in this  
study, such as homogeneity of the study population and its size, individualized  
versus protocol treatment and the adequacy of mathematical modelling are  
discussed. Prospective evaluation of this model should prove its value.  
Figures 2; references 26: 10 Russian, 16 Western (1 by Russian author).

7813/9835  
CSO: 1840/1128

UDC 616.89-008.4449-092.9-02:615:214.547.562

PHARMACOETHOLOGICAL ANALYSIS OF ACTION OF SOME  $\beta$ -CARBOLINES

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 99,  
No 3, Mar 85 (manuscript received 13 Jan 84) pp 323-325

[Article by V.P. Poshivalov, Department of Pharmacology (Chairman  
Yu.D. Ignatov) First Leningrad Medical Institute imeni Academician I.P. Pavlov]

[Abstract] Pharmacoeithologic activity of  $\beta$ -carbolines was studied on aggressive  
CC57W male mice. It was shown that  $\beta$ -carboline-3-carboxyethyl ester (CBC-3-  
CEE) a known antagonist of benzodiazepine (BDZ) receptors intensified  
aggressiveness and manifestations of threat, increased ambivalence and  
lowered intraspecies sociability; it increased grooming and diminished threat  
manifestations and sociability while activating locomotion. 1-Methyl-6-  
hydroxytetrahydro- $\beta$ -carboline intensified the threat and ambivalent behavior.

It was concluded that BDZ receptors are involved in the integration of interspecies sociability and aggressive behavior of the attack type. Defense type aggression appeared to have no inhibitory  $\beta$ -carboline control. Aggression resulting from the action of  $\beta$ -carboline was easily provoked with tactile action while sociability was not. Evidently, effector mechanisms relating to response aggression are not damaged by  $\beta$ -carbolines. References 9: 5 Russian, 4 Western (1 by Russian authors).

7813/9835  
CSO: 1840/1129

UDC 616.006.04-085.1.015.2:615.283.612.1

#### METRONIDAZOLE IN RADIOTHERAPY OF MALIGNANT TUMORS

Moscow MEDITSINSKAYA RADIOLOGIYA in Russian No 7, Jul 86  
(manuscript received 21 Oct 85) pp 6-13

[Article by S.L. Daryalova, P.Yu. Polyakov, Ye.S. Kiseleva, Ye.S. Zimina, V.M. Zelvin, F.M. Lyass, I.A. Kachkov, I.I. Pelevina, Z.I. Khmelevskaya, G.T. Kudryavtseva, S.N. Katsalap, Y.S. Mardynskiy, V.G. Andreyev, Yu.I. Vorobyev, I.V. Limarova, K.I. Zholkiyer, N.A. Azhigaliyev, K.Kh. Mukhamedzhanov and G.A. Mukhambetova, Moscow]

[Abstract] Analysis of clinical data were reported on the use of metronidazole (MZ) as a radiosensitizer. The report covered 1400 patients entered on study by five collaborating institutes; 800 patients were in the experimental group, 600 in the control group. The optimal route of drug administration was oral and oral-rectal, with doses of 5-8 g/m<sup>2</sup> or 12-14 g, respectively. The rectal route by itself was not effective. Tumor localization varied extensively, most patients begin in the stages III or IV. A series of specific protocols was reported leading to the conclusion that it is necessary to use adequately high doses of MZ which could lead to the required concentrations in blood. Irradiation should follow this drug in about 3 to 6 hours. Under such conditions, a marked radiosensitizing effect was noted. MZ appeared to increase postoperative complications. About 2/3 of the patients exhibited dyspeptic problems, nausea and vomiting. MZ affected the liver functions, albeit in a reversible fashion.

7813/9835  
CSO: 1840/1130

UDC 613.796.799:766.2:612.43

INFLUENCE OF HIGH TEMPERATURE ON TOTAL GAS METABOLISM OF ANIMALS WITH  
LIMITATION OF MOTOR ACTIVITY

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 5, Sep-Oct 86  
(manuscript received 12 Jul 84) pp 29-31

[Article by R.M. Kafizova, Institute of Physiology, Uzbek SSR Academy of  
Sciences]

[Abstract] A study was made of gas metabolism in 50 white rats exposed to high temperatures with limited motor activity. The animals were exposed to temperatures of 40-42°C for 2 hours each day, some in restrictive 8x15x8 cm cages which limited their motor activity. Oxygen consumption, carbon dioxide liberation, respiratory coefficient, body temperature and mass were recorded on days 1, 15, 30 and 60 of the experiments before and after exposure to the high temperatures. Exposure to heat was found to decrease oxidative processes in the organism independently of motor activity status. This decrease was still stronger in animals exposed to heat with limitation of motor activity. In both cases, the animals adapted to the conditions of the experiments. Figures 2; references: 4 Russian.

6508/9835

CSO: 1840/681



UDC 616.127-005.8-085.31:[547.95;547.943]-036.8:616.127-003.9

INFLUENCE OF OPIOID PEPTIDE ON HEALING OF EXPERIMENTAL MYOCARDIAL INFARCTION

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 12, Dec 86 (manuscript received 7 Jan 86) pp 754-757

[Article by N.I. Afonskaya, O.B. Il'inskiy, V.F. Kondalenko, S.Ye. Spevak and N.M. Cherpachenko]

[Abstract] A study is reported of the influence of a synthetic Leu-enkephalin analog, dalargin (Tyr-Dala-Gly-Phe-Leu-Arg) on healing of an experimental myocardial infarction. Experiments were performed on 62 male chinchilla rabbits with myocardial necrosis induced by ligature of the descending branch of the left coronary artery. The animals were sacrificed at the maximum of the healing process on the third day after surgery or at the time of completion of healing on the seventh day. In one group of animals, dalargin was administered for two days before surgery and continued afterward at 10 µg/kg per day, in another, dalargin was administered starting 30 minutes before surgery. Sections were studied by light and electron microscopy. It was found that dalargin accelerated the process of healing, stimulating the growth of capillaries and the formation of myofibroblasts. Figures 2; references 6: 5 Russian, 1 Western.

6508/9835

CSO: 1840/736

UDC 616.127-007.616.127-008.3-02:613.863]-092.9

INFLUENCE OF EMOTIONAL-PAIN STRESS ON CONTRACTILE FUNCTION OF MYOCARDIUM DURING LONG-TERM HYPOKINESIA

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 98, No 12, Dec 84 (manuscript received 2 Feb 84) pp 651-653

[Article by A.I. Saulya, Kishinev Medical Institute]

[Abstract] A study was made of the influence of emotional-pain stress on the contractile function of the myocardium of animals which had been maintained in long-term hypokinesia. Experiments were performed on 64 male Wistar rats following 60 days in small movement-restricting cages and exposure to 6-hours alarm neurosis. The results indicated that long-term hypokinesia caused a significant increase in the amplitude of contraction, speed of contraction and relaxation of the isolated posterior left ventricular papillary muscle, i.e., a depression in the contractile function of the cardiac muscle. The main parameters of the contractile function of the myocardium of the smaller hearts in the experimental animals which had not grown as a result of long-term hypokinesia were many times higher after stress than in the control group. The data indicate that the stress depression of the contractile function is

less dangerous for animals following long-term hypokinesia than for the control animals. Long-term hypokinesia may represent a chronic stress factor, causing partial adaption to stress and thus increasing the resistance of the heart to stress. References 7: 5 Russian, 2 Western.

6508/9835  
CSO: 1840/728

UDC 612.822.3+615.78

DIFFERENCE OF TIME INTERVALS OF ACTION OF MEDIATORS ON NERVE CELLS AS METHOD OF INFORMATION CODING

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 293, No 2, Mar 87  
(manuscript received 12 Aug 86) pp 485-488

[Article by B.I. Kotlyar and A.A. Myasnikov, Moscow State University  
imeni M.V. Lomonosov]

[Abstract] A study of the role of various mediators in information coding used analysis of the reaction rate of 104 neurons of the sensomotor region of rat cortex to microionophoretic feed of inhibitors L-glutamate (Gl), acetylcholine (AC), noradrenalin (NA) and gamma-amino butyric acid (GABA). There were significant differences in the effects of the mediators in both the changes of pulsation (excitation, inhibition or a specific sequence of alternation of them) and in the time range of their effect. A very significant difference in time range of effect was noted in the influence on the nerve cells by mediators evoking predominantly excitation (Gl and AC) and inhibition (Na and GABA) reactions. While short-latent excitation of the neurons by Gl stopped quickly after cut-off of the phoresis current, excitatory components of reactions to AC arose later and became tonic. Use of similar conditions of microfeed of the mediators produced only partial overlapping of the time ranges of the evoked reactions. Significant differences in time ranges occurred also under analogous conditions of feeding NA and GABA to the nerve cells. After cut-off of the phoretic current, tonic inhibition caused by NA become most pronounced while the reaction to GABA ended quickly. These data justified the assumption that the time of effect of the excitatory and inhibitory mediators may serve as a method of information coding. It was assumed that the multiplicity of mediators in the central nervous system ensures the highest possibility of interaction of heterofunctional information, entering the synapses of different chemical nature. Figures 2; references: 10 Russian.

2791/9835  
CSO: 1840/606

## CORRELATION MATRIX OF HEMODYNAMIC INTERRELATIONSHIPS AS STATUS INDICATOR OF AUTONOMIC HOMEOSTASIS

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA in Russian No 6, Nov-Dec 86 (manuscript received 24 Sep 85) pp 943-946

[Article by N.V. Dmitriyeva, Scientific Research Institute of Normal Physiology, USSR Academy of Medical Sciences, Moscow]

[Abstract] A matrix approach was taken to the analysis of the correlations existing among EKG, respiratory rate, blood pressure, rheographic index, anacrotic time, and Q-A interval parameters during induction of the adaptation syndrome in rats by cardiovascular and autonomic drugs. The graphical data were interpreted to demonstrate a change in the degree and nature of correlation with the onset of the chemically-induced adaptation syndrome in the experimental animals, resulting in an 'autonomic portrait' of homeostatic adjustment. Thus, for example, in the intact rats, an increase in the heart rate was accompanied by a decrease in the electrical atrial and ventricular systole, as well as depression of the amplitudes of the T and R waves. The amplitude of the P wave, however, was enhanced. No attempt was made to formalize this approach to autonomic homeostasis, but merely to suggest its putative indicator value. Figures 2; references 28: 25 Russian, 3 Western.

12172/9835

CSO: 1840/674

UDC 612.83.018:577.175.82]-088.1

## PEPTIDERGIC ASYMMETRY IN RAT SPINAL CORD

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian Vol 102, No 11, Nov 86 (manuscript received 13 Mar 86) pp 528-530

[Article by G.N. Kryzhanovskiy, V.K. Lutsenko and M.Yu. Karganov, Scientific Research Institute of General Pathology and Pathologic Physiology, USSR Academy of Medical Sciences, Moscow]

[Abstract] Outbred rats were employed in a study designed to further test functional asymmetry in the spinal cord, through extraction of lateralization factors (LF) from the lumbrosacral region and evaluation of their effects on ipsi- and contralateral muscle tone of posterior extremities. Intracisternal injection of LF isolated from the right or left half of the spinal cord led to a change in muscle tone of the respective extremity. Prolonged passive extension was approximately 10-fold greater in the ipsilateral extremity than in the contralateral extremity. Extracts from the entire cross-section of the lumbar spinal cord led to a more prolonged passive

extension on the right than on the left side, although the change was less pronounced than that obtained with LF derived from the right half of the spinal cord. Combined extracts from the right and left sides of the spinal cord yielded similar results. Subdural application of LF derived from either the right or left side of the spinal cord also evoked side-related changes in muscle tone, indicating lateralization of specific LF receptors. These observations provide additional substantiation for the concept of functional lateralization in the spinal cord. References 13: 8 Russian, 5 Western.

12172/9835  
CSO: 1840/734

#### USE OF SENSORY-PERCEPTIVE CHARACTERISTICS OF NOISE-EMITTING OBJECTS IN TRAINING OF SONAR OPERATORS

Moscow VOPROSY PSIKHOLOGII in Russian No 2, Mar-Apr 86 (manuscript received 25 Mar 85) pp 156-161

[Article by K.V. Bardin, V.I. Basha and V.G. Voytenko]

[Abstract]. An analysis was undertaken on the factors determining occupational success of sonar operators, the primary task of which consists of accurate sound identification. Studies with 30 trainees demonstrated that in addition to acquiring skills in identifying sound signals on the basis of objective characteristics (intensity, pulsation frequency, variation, etc.), a second sensory-perceptive component is equally--if not more--important. The latter factor deals with the construction of subjective identifying 'markers', both those suggested by the instructor and endogenously generated on the basis of day-to-day experience (i.e., individualized or idiosyncratic). In the latter category the input noise signal is identified as, for example, being analogous to a transformer hum or a jet plane taking off. Frequently, an imagery component is attendant to the latter form of identification. However, the success of individuals as sonar operators is, in the final analysis, dependent on cognitive flexibility, regardless of whether they place primary reliance in noise signal identification on the objective or subjective criteria. References: 15 Russian.

12172/9835  
CSO: 1840/1054

STOP-FLOW EVALUATION OF NEPHRON FUNCTION IN HEMORRHAGE AND INFUSION THERAPY WITH PLASMA EXPANDERS

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 32, No 2, Mar-Apr 86  
(manuscript received 16 Nov 85) pp 193-198

[Article by V.I. Fedorov, Kiev Medical Institute imeni A.A. Bogomolets, Ukrainian SSR Ministry of Health]

[Abstract] Outbred dogs were employed in a study of renal function as affected by a 50% loss of total blood volume, and the effects on nephron function of infusion therapy with plasma expanders. Acute blood loss led to impaired nephron function and altered electrolyte status in the distal segments. Intravenous drip infusion (60-80 drops/min) with polyglucin or gelatinol supplemented with Na salts and lactic, succinic and ketoglutaric acids led to an increase in the Na load, and stimulated the secretion of K and resorption of Cl in the distal tubules. These observations underscore the beneficial effects of the lactic, succinic and ketoglutaric acid components as factors improving the metabolic status of the distal tubules and, hence, contributing to a normal Na/Cl balance. The latter relationship is of primary importance for a normal osmotic pressure of the urine. Figures 1; references 19: 12 Russian, 7 Western.

12172/9835

CSO: 1840/780

CORRECTION OF ACUTE HYPOXIA-INDUCED CHANGES IN BLOOD COAGULATION IN RABBITS

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 32, No 2, Mar-Apr 86  
(manuscript received 29 Oct 84) pp 217-221

[Article by V.V. Bakanskaya, Grodno Medical Institute, Belorussian SSR Ministry of Health]

[Abstract] Experimental therapeutic trials were conducted with rabbits to assess the utility of combined therapy with rheopolyglucin and nicotinic acid in overcoming hypercoagulation induced by acute hypoxic hypoxia. Exposing the animals to conditions simulating an altitude of 8000 m for 1 h in a pressure chamber accelerated coagulation and thrombogenesis, whereas pretreatment of the rabbits with rheopolyglucin (5 ml, i.v.) and nicotinic acid (10 mg/kg, i.m.) prevented the onset of hypercoagulation. Administration of rheopolyglucin and nicotinic acid to control rabbits was without marked effect on blood coagulation status, with the exception that the fibrinolytic system showed some activation and blood levels of free heparin were somewhat elevated.

These changes were felt to underlie the therapeutic efficacy of the combined therapy in preventing hypercoagulation. Figures 1; references 19: 15 Russian, 4 Western.

12172/9835  
CSO: 1840/780

UDC 612.13+612.815.1

# FUNCTIONAL SIGNIFICANCE AND MECHANISMS OF VARIABILITY IN BARORECEPTOR REFLEX

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I.M. SECHENOVA in Russian  
Vol 72, No 11, Nov 86 (manuscript received 31 May 85) pp 1473-1485

[Article by N.A. Steepochkina, Shipbuilding Institute, Leningrad]

[Abstract] A literature survey is presented of current information on the relationship between contraction of skeletal muscles and function of the baroreceptor mechanisms, both carotid and aortic. The consensus shared by most workers appears to be the concept that the baroreceptor reflex shows considerable functional plasticity since its primary function is not to maintain arterial blood pressure within a given range, but to define an optimal range for cardiac function. Under optimal conditions, the heart provides vital organs with the proper blood supply and functions in its most economic mode within the framework of a physiological optimum. In special situations the baroreceptor reflex may be completely inhibited whenever maximum blood supply to a given organ is required in extreme states, such as leg muscles in a flight-or-perish situation. In man, the baroreceptor mechanism is excluded when the heart rate exceeds 190 beats per minute, allowing maximum supply of nutrients and oxygen to the skeletal muscles. In this case the exclusion of the baroreceptors offers considerable advantage and demonstrates the flexibility of the cardiovascular system in meeting various physiological requirements. References 96: 12 Russian, 84 Western.

12172/9835  
CSO: 1840/797

## SYSTEMIC HEMODYNAMIC SHIFTS IN HYPOXIA

Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I.M. SECHENOVA in Russian  
Vol 72, No 11, Nov 86 (manuscript received 31 Jan 86) pp 1515-1522

[Article by Nurmatov, A.V. Samoylenko and B.I. Tkachenko, Laboratory of Circulatory Physiology and Pathology, Department of Visceral System Physiology imeni Academician K.M. Bykov, Scientific Research Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad]

[Abstract] Anesthetized cats were employed in a study designed to assess the hemodynamic effects of light and moderate hypoxia. Using an O<sub>2</sub>/N<sub>2</sub> inhalation mixture containing 14% O<sub>2</sub> or 10% O<sub>2</sub> resulted in hemodynamic shifts attributable largely to a decrease in peripheral vascular resistance. The venous return increased by 4.6% in the 14% O<sub>2</sub> experiment, and by 21% in the 10% O<sub>2</sub> studies. The increase in the cardiac output was due to the increase in the stroke volume since the heart rate decreased in both hypoxic states. The reduction in blood pressure was more pronounced with moderate hypoxia than with light hypoxia, and in both cases the increase in the venous return was primarily due to the greater inflow from the superior vena cava. The latter phenomenon may reflect the fact that a greater portion of the cardiac output was directed to the cranial circulation to assure an adequate oxygen supply to the brain. Figures 4; references 13: 9 Russian, 4 Western.

12172/9835

CSO: 1840/797

## OPEN IONIC CHANNEL BLOCKAGE AS MECHANISM OF SELECTIVE BLOCKAGE OF SYNAPTIC TRANSMISSION

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 32, No 6, Nov-Dec 86  
(manuscript received 27 Jun 86) pp 646-656

[Article by V.I. Skok, Institute of Physiology imeni A.A. Bogomolets, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] Electrophysiological studies with the superior cervical ganglia of rabbits and rats demonstrated that hexamethonium, a selective sympathetic ganglioblocker, at low concentrations (e.g., 10<sup>-5</sup> M) blocks only the open channel of nicotinic acetylcholine (ACh) receptors without evidence of competitive blocking (in distinction to tubocurarine, a nonselective ganglionic blocker). The rate constant for the binding of hexamethonium with the open channel corresponded to its activity in blocking synaptic transmission. Additional data are also consonant with the view that the binding site of hexamethonium on the open channel regularly binds Ca<sup>++</sup> as well as ACh. Figures 4; references 55: 3 Russian, 52 Western.

12172/9835

CSO: 1840/785

## BIOLOGICAL ACTIVITY OF CEREBROSPINAL FLUIDS OF PERSONS WITH SPINAL CORD INJURIES

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 293, No 1, Mar 87  
(manuscript received 21 Jul 86) pp 243-245

[Article by S.V. Medvedev, Ye.I. Chumasov, Yu.V. Balabanov, V.L. Silakov and F.A. Gurich, Scientific Research Institute of Experimental Medicine, Academy of Medical Sciences, USSR, Leningrad; Leningrad Institute of Informatics and Automation, USSR Academy of Sciences]

[Abstract] The biological effect of cerebrospinal fluid of patients with spinal cord injuries, before and after intramedullary electro-stimulation, on the growth and development of cellular elements of rat spinal cord embryonal nerve tissue was determined in cerebrospinal fluid cultures of 17-18-day old mongrel rat embryos. The morphofunctional state of the cultures was studied by intravital phase-contrast microscopy and neurohistological methods. It was found that the nerve cell culture may be used to determine the biological effects of substances found in the cerebrospinal fluid of patients. Fluid from patients with spinal cord fracture produced a cytotoxic effect on the cultures and destroyed nerve and glial cells while fluid from the same patients, after electro-stimulation, caused no significant necrotic changes in the explants and did not prevent regeneration of neural processes. It was assumed that biologically active substances enter the cerebrospinal fluid during electro-stimulation and these substances stimulate regeneration processes and, possibly, inactivate neurotoxic factors found in the cerebrospinal fluid of persons with spinal cord injury. References: 3 Russian.

2791/9835  
CSO: 1840/577

UDC 616-005.1:612.22.02+612.235

## PULMONARY BLOOD OXYGENATION IN ACUTE CONTROLLED BLOOD LOSS

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 32, No 3, May-Jun 86  
(manuscript received 16 Jan 85) pp 344-350

[Article by M.M. Seredenko, V.P. Pozharov, T.D. Minyaylenko and R.F. Bepalchaya, Institute of Physiology imeni A.A. Bogomolets, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] Studies were conducted on the transportation of blood gases in outbred rats (150-250 g) subjected to loss of 25-30% of the circulating blood volume at a rate of 1 ml/min. Within 5-30 min of the insult, pulmonary and alveolar ventilation were not enhanced in response to tissue hypoxia and acidosis, while the respiratory rate, respiratory volume and the minute



volume showed a marked decrease. Inhalation of hypoxic and hypercapnic gas mixtures promoted an adequate increase in alveolar ventilation. Despite the reduction in the efficiency of oxygenation of the blood in the lungs, the transportation of the respiratory gases at the alveolar level correlated with the physiological requirements for oxygen and production of carbon dioxide under conditions of acute blood loss. Figures 1; references 17: 2 Ukrainian, 11 Russian, 4 Western.

12172/9835

CSO: 1840/781

UDC 577.37;577.352.4.5:591.044.2:612.819

# EFFECTS OF SODIUM CONCENTRATION ON TETRODOTOXIN BLOCKAGE OF SODIUM INFLUX

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 32, No 4, Jul-Aug 86  
(manuscript received 15 Jul 85) pp 442-448

[Article by Z.A. Sorokina and I.V. Chizhmakova, Institute of Physiology  
imeni A.A. Bogomolets, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] Isolated nerve preparations from the spinal ganglia of rats were employed in a voltage clamp and perfusion study of the effects of  $\text{Na}^+$  concentration in the bathing medium on tetrodotoxin (TTX) effect on sodium channels. Evaluation of the binding data demonstrated that the  $K_d$  for TTX-channel complex was not affected by the  $[\text{Na}^+]$ , indicating a lack of competition for the binding sites. These observations indicate once again that different study techniques lead to different conclusions regarding the effects of  $\text{Na}^+$  on the binding of TTX to sodium channels. Studies with isolated nerve membranes, that point to the existence of this type of competitive interaction, apparently reflect experimentally-induced conformational changes in the sodium channels. Figures 4; references 34: 6 Russian, 28 Western.

12172/9835

CSO: 1840/782

UDC 616-005.1+612.223.1:612.22.02+612.235

EFFECTS OF MID-ALPINE ALTITUDES ON COMPENSATORY RESPONSES IN ACUTE AND CHRONIC BLOOD LOSS WITH SUBSTITUTION THERAPY

Kiev FIZIOLOGICHESKIY ZHURNAL in Russian Vol 32, No 4, Jul-Aug 86  
(manuscript received 21 Jan 85) pp 455-460

[Article by Ye.V. Rozova, Institute of Physiology imeni A.A. Bogomolets, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] An evaluation was performed on the compensatory mechanisms involved in acute and chronic blood loss with substitution therapy under mid-alpine conditions (2100 m) in albino rats (130-200 g). In acute experiments the blood loss was equivalent to 10-15% or to 25-30% of the total blood volume over a 3-4 min period, with Geossen replacement. In the chronic experiments, the blood loss represented 10% three times over a 2 week period, for a total of 30% over the 2 week period. The monitored parameters included blood oxygen volume, Hb concentration,  $V_T$ ,  $V_E$ ,  $\dot{Q}$ ,  $P_aCO_2$ ,  $P_aO_2$ , etc. The data were interpreted to indicate that the elevation exerted a positive effect, in that frank hypoxia was not present, and there were no significant changes in alveolar oxygen transport. However, in the case of chronic blood loss, frank hypoxia was evident and attributable to exhaustion of compensatory capabilities. The conditions were characterized by progressive reduction in erythrocyte counts, blood oxygen volume, and decreasing Hb concentration. Pulmonary ventilation suffered due to attenuated respiratory volume, with similarly compromised alveolar ventilation. The decrease in the circulatory minute volume sharply reduced arterial oxygen transport. Figures 4; references 16: 1 Ukrainian, 14 Russian, 1 Western.

12172/9835  
CSO: 1840/782

UDC 616.155.25-02:613.863]-092.9-09

EFFECTS OF IMMOBILIZATION STRESS ON MEGAKARYOCYTE-THROMBOCYTE SYSTEM IN MICE

Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA in Russian No 4, Jul-Aug 86 (manuscript received 10 dec 85) pp 30-35

[Article by F.Z. Meyerson, B.A. Frolov and A.A. Stadnikov, Orenburg Medical Institute; Institute of General Pathology and Pathologic Physiology, USSR Academy of Medical Sciences, Moscow]

[Abstract] A variety of blood coagulation parameters were monitored in (CBA x C57Bl6)F<sub>1</sub> mice subjected to stress in the form of 6 h of immobilization, since such conditions predispose to hypercoagulation problems. Within

5 min of immobilization the coagulation time decreased by 25% and thrombocyte counts increased by 20%. The blood coagulation times remained depressed during a 120 h post-immobilization period (with a slight above-baseline peak at 24 h post-immobilization period), while thrombocyte counts remained below baseline value during that time. Intravenous administration of thrombin to the stressed mice at 72 and 120 h after immobilization resulted in respective survival figures of 55.0 and 28.6%, vs. 69.6% in control mice. The data were consistent with the interpretation that immobilization led to enhanced hypercoagulability, as indicated by the blood chemistries, the increased thrombocyte counts, potentiation of the lethal effects of thrombin injection, and the observation that bone marrow and splenic counts of megakaryocytes were significantly elevated. References 18: 14 Russian, 4 Western.

12172/9835

CSO: 1840/786

NEW MEDICAL CENTER IN LENINGRAD

Leningrad LENINGRADSKAYA PRAVDA in Russian 6 Feb 87 p 1

[Article by T. Chesanova]

[Abstract] A new uronephrologic center has been organized within the facilities of First Medical Institute imeni I.P. Pavlov with a capacity for 360 patients. It is equipped with modern x-ray and isotope imaging units, tomographic gamma cameras, ultrasound equipment to permit effective diagnostic work. Clinical biochemistry laboratory will provide necessary tests. Thirty "artificial kidneys" will be installed in the Center to permit adequate hemodialysis therapy. The problem facing the physician is that kidney problems develop for a long time without any symptoms. To support the outreach activity of this center, five branches were set up throughout the city to reach patients at their community level. The final touches are still being made, while actual work is already in progress in some parts of the center complex. It is about eight years behind schedule mostly because of constructional difficulties. Hope was expressed that these final difficulties will be resolved soon. Figures 2.

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CSO: 1840/699

CENTRALIZATION OF VACCINATION RECORDS IN RURAL AREAS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 9, Sep 86 pp 17-18

[Article by M.G. Isakakova, Dzhangali Central Rayon Hospital, Ural Oblast]

[Abstract] Dzhangali Rayon is located in south-western Ural Oblast, it is a semidesert area with 21,800 km<sup>2</sup> coverage and a population of 21251, including 7640 children under 14 years of age. Nine pediatricians and 28 middle medical personnel are serving this children population. There are 63 pediatric beds in the hospital. In the last five years, there were no cases reported of diphtheria, scarlet fever or polio in this area. In order to improve immunoprophylactic service even more, a decision was made to centralize the f.63 files. In 1981 this centralization was achieved making it

easier to monitor the status of vaccination. The results became immediately noticeable: in 1981 a 90% level of immunoprophylaxis of child infections was achieved; in 1983--98% and in 1984 a 98.9% level.

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#### PROTECTION OF CHILDREN'S HEALTH IN RURAL SETTING

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 9, Sep 86 pp 3-8

[Article by G.Kh. Akhmetova, Deputy Minister of Public Health, Kazakh SSR]

[Abstract] A report is presented of the state of public health in rural Kazakhstan at the eve of the 12th Five-Year Plan. Much has been achieved during the past five years in terms of construction of new facilities. The budget grew by 19.2%. Statistics was presented describing new hospitals and various subunits, number of beds and attending medical staff, improvements in available support to local populace, etc. Special attention was given to pediatric care even for the children of nomadic herdsman. Nutritional aspects were improved for the very young, by setting up new "milk kitchens". Contraceptive service became available. Improvements were achieved in ambulance service, in proficiency of medical staff and in their postgraduate education. However, problems still exist. There is a shortage of 6,000 pediatricians, 1,000 gynecologists; a construction program was fulfilled only to about 70% of the projected level. Hospital rooms are too small and there is a shortage of about 5,560 beds for the OB/GYN service. The number of abortions is increasing. Children and mother's death rate is either increasing or remains very high. To combat some of these problems, increased budget is foreseen for the next Five-Year Plan, at least for the constructions.

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UDC 617.7-053.2-084.3

#### CONTINUOUS COOPERATION AMONG OPHTHALMOLOGISTS AND PEDIATRICIANS IN ANNUAL SCREENING PROGRAM--DISPENSARIZATION

Moscow VESTNIK OFTALMOLOGII in Russian Vol 102, No 6, Nov-Dec 86  
(manuscript received 24 Jan 86) pp 8-11

[Article by Ye.I. Kovalevskiy and A.B. Korolchuk, Moscow Children's Eye Center of the No 1 Children's Clinical Eye Hospital]

[Abstract] An annual eye screening program has been developed at the Moscow Children's Eye Center, which provides for visual monitoring and care from the

neonatal period through adolescence. The program has been designed to fit within annual health screening (dispensarization) and relies heavily on ongoing close cooperation between pediatric ophthalmologists and pediatricians. The program is divided into 6 phases corresponding to different age groups and developmental stages, providing differential clinical approaches. Evaluation of 5-year results have shown that the program has been successful in reducing the incidence of visual disorders 2-fold in preschoolers as a result of timely clinical intervention. Figures 1; references: 10 Russian.

12172/9835

CSO: 1840/678

#### CLEAR REPORTING OF OCCUPATIONALLY-RELATED ILLNESS

Moscow MOSKOVSKAYA PRAVDA in Russian 18 Mar 87 p 3

[Article by V. Pushin, Chief Division of Safety Technology, All Union Association "Soyuzatomenergostroy"]

[Abstract] The issue of occupational disease reporting was raised. No annual reports are available on this subject, only statements concerning the drop in the percent of injuries. This is especially a problem for women who now represent 70% of all manual workforce (most of the mechanized, automated jobs are going to men). The level of noise in textile factories is 2-5 fold that of maximum permissible levels. Dust exceeds ten-fold the approved thresholds in wood processing industry, in food, footwear, ceramics and other workplaces usually employing women. This lack of interest on the side of administration is puzzling. Each case of work-related disease should be analyzed in order to improve working conditions; 25% of all diseases are the result of poor working conditions. The statistics on work related injuries and diseases should be reported routinely.

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INCIDENCE OF ADULT TRAUMA IN RURAL AREAS AND EXPERT EVALUATION OF MEDICAL ASSISTANCE AFFORDED

Moscow ORTOPEDIYA, TRAVMATOLOGIYA I PROTEZIROVANIYE in Russian No 7, Jul 86 (manuscript received 21 May 85) pp 55-58

[Article by V.Ya. Kiselev, V.S. Korolev, L.I. Startsev and N.A. Frolov, Chairs of Social Hygiene and Public Health Administration and of Traumatology and Orthopedics, Laninin Medical Institute]

[Abstract] An evaluation in two rural rayons in the Kalinin Oblast showed that in 1980 the incidence of trauma among the males was 2.3-fold greater than among the females. The data for the Rmaeshkovskiy and Maksatikhinskiy Rayons also showed that the highest incidence of trauma among males occurred in 20-29 age bracket, and a decade later (30-39 years) among the females. Household injuries accounted for 40.4% of the male trauma and 49.0% of the female trauma. The respective male and female figures for transportation-related trauma was 19.0% and 17.6%, and the respective figures for occupational trauma were 15.7 and 11.8%. Alcoholism was seen to be a predisposing factor in 40.5% of the cases of male trauma, and in 10.6% of the female trauma. Evaluation of the medical assistance in these two rayons showed that in only 26.7% of the cases was medical attention obtained within an hour of the injury. In addition, ambulance service was found to have serious deficiencies, and the local physicians were found to be in need of special training to enhance their effectiveness in managing medical emergencies. References: 6 Russian.

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CSO: 1840/1089

MORBIDITY IN FAMILIES RELOCATING TO WESTERN SIBERIA

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 8, Aug 86 (manuscript received 26 Nov 85) pp 17-20

[Article by I.S. Zubrilin, Chair of Social Hygiene and Public Health Administration, Tomsk Medical Institute]

[Abstract] A comparative analysis was conducted on the morbidity statistics of 226 local families and 312 families that relocated to Tomsk in connection with the opening of a chemical plant. The data showed that during the first year the morbidity figures for the new arrivals were lower than for the local residents, but exceeded the incidence of disease of the local population in the subsequent years. On an overall basis, for a 4-year period of observation, the incidence for the new arrivals was 1669.4/1000, and for the local residents 1431.7/1000. The highest incidence of disease for the new arrivals was noted in the 3rd year after arrival. These observations point

to the need for taking such factors as duration of residence in a locality into consideration in health care delivery and in planning health services.

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CSO: 1840/1085

UDC 312.2+312.1]-053.2

#### IMPACT OF CHILD'S DEATH ON SUBSEQUENT FAMILY FERTILITY PATTERNS

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 8, Aug 86  
(manuscript received 18 Oct 85) pp 25-28

[Article by I.P. Katkova and I.S. Shurandina, Chair of Social Hygiene and Public Health Administration, First Moscow Medical Institute; All-Union Scientific Research Institute of Social Hygiene and Public Health Administration imeni N.A. Semashko]

[Abstract] An analysis was conducted on the effects of the death of a child on subsequent fertility patterns in young families. Observations and questionnaires were conducted 2 to 2.5 years after the death on 350 families in Moscow, between 1976 and 1979. The study showed that 60.9% of the couples went on to have other children, and that 5.7% of the women were pregnant. However, 33.4% of the couples either decided against having children or postpone them to a much later date. Furthermore, the study also revealed that, after the death of the first child, the incidence of divorce reached 13.7%, and, after the death of a second child, 13.4%. These observations suggest the need for a much stronger involvement of the social services and the medical profession in offering counseling and support to young couples faced with the loss of a child in the early stages of family building. References: 9 Russian.

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CSO: 1840/1085



PREVENTION OF INFECTIOUS DISEASES IN UKRAINIAN SSR

Kiev VRACHEBNOYE DELO in Russian No 10, Oct 86 pp 1-5

[Article by K.M. Sinyak and T.I. Kasyanenko, Kiev Institute for the Advanced Training of Physicians]

[Abstract] The principal direction for improvement of Soviet health status is prevention of diseases. The leading role in this area is played by the sanitary-epidemiological stations which are responsible for protection of the environment, implementation of measures for improvement of working conditions etc. In UkSSR, there are 732 sanitary-epidemiological stations, 35 disinfection points, 685 bacteriological and 197 hygienic laboratories equipped with modern instrumentation. Professional competence is the basis for improvement of the efficiency of medical service. Laboratories also play an important role in this complex. The goal for the next Five-Year Plan is to develop virological laboratories, to improve serological testing. Some of the tasks of the sanitary epidemiological service involve timely and continuous detection of all diseased patients, determination of cause-effect relationships and ecological studies. A special attention during the 12th Five-Year Plan will be given to intensified preventive programs aimed at population-based intervention which will require extensive educational programs.

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CSO: 1840/1108

OPTIMIZATION OF INFORMATION SERVICE IN PUBLIC HEALTH ADMINISTRATION OF RURAL COMMUNITIES

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 7, Jul 86  
(manuscript received 20 Jan 86) pp 31-35

[Article by M.M. Kozybayeva, All Union Scientific Research Institute of Social Hygiene and Organization of Public Health imeni N.A. Semashko, Moscow]

[Abstract] Current state of the information service provided by the health service administration on the level of rural communities was analyzed using 60 treatment and preventive institutions from many republics: central hospitals, outpatient centers, midwife points, first aid stations etc. In general, three types of organizations involved in collection of medical statistics were identified: centralized, decentralized and mixed. The highest level of professional activity (81.6%) was found in centrally-organized

facilities. The following measures were recommended to improve the situation in this area: tailoring the most rational organizational schemes to local requirements; strict regulation of the responsibilities of medical-statistical staff and supportive personnel in collection of medical data; optimization of central hospital services for medical statistics and accounting; development of uniform requirements for information collection; computerization of routine activities, and professional development of the staff.

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CS0: 1840/1101

UDC 616-001.28-06:616-001.17]-07:[616.153.436+616.153.757]-092.9

EFFECTS OF COMBINED RADIATION AND THERMAL INJURIES ON TAURINE AND TRYPTOPHAN METABOLISM

Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA in Russian No 6, Nov-Dec 86 (manuscript received 17 Jun 85) pp 53-56

[Article by L.A. Konnova and G.S. Novoselova, Laboratory of Early Diagnosis of Radiation Injury, Central Scientific Research Institute of Roentgenoradiology, USSR Ministry of Health, Leningrad]

[Abstract] Serum levels of taurine (I) and tryptophan (II) were monitored in outbred rats (180-220 g) subjected to either gamma irradiation, burn trauma (IIb degree, 15% body surface), or a combination radiothermal injury. Burn injury alone resulted in a marked elevation of I at 6 h and a secondary smaller peak at 72 h in the case of I. The effects on II also included a major peak at 6 h and a smaller peak at 6 days. Irradiation with a 3 Gy dose (0.92 Gy/min) showed a peak in I at 6 h and return to essentially baseline values after 72 h, whereas a 6 Gy dose showed a peak at 6 h and a fall to below baseline values by 48 h that persisted for 30 days. The effects of 3 Gy on II consisted of elevation at ca. 6 days, whereas 6 Gy showed a diffuse peak over 6-24 h and a somewhat more pronounced peak at 15 days. Combination of the burn injury with 3 Gy gamma irradiation abolished the secondary rise in I seen with the burn injury alone, whereas the pattern in the combination with 6 Gy was similar to that obtained with 6 Gy alone. The primary effects of 3 or 6 Gy gamma irradiation in combination with the thermal injury were to attenuate the changes seen with the latter alone in the case of serum levels of II, but to maintain the levels above baseline concentrations. Figures 2; references: 9 Russian.

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CSO: 1840/788

RADIOMODIFYING EFFECT OF HYPOXANTHENE AS FUNCTION OF ITS CONCENTRATION

Alma-Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR, SERIYA BIOLOGICHESKAYA  
in Russian No 1, Jan-Feb 87 pp 709

[Article by M.A. Berdina, A.T. Seysebayev and A.A. Zamanbekova, Institute  
of Botany, KASSR Academy of Sciences]

[Abstract] Hypoxanthene (HX) is an effective regulator of cell division. Its radio-modifying activity was investigated using the degree of structural chromosome mutations resulting from postradiological treatment of seeds with HX. Chernigovskiy-5 barley was used in these experiments; the seeds were modified with 150 G gamma rays and immediately soaked in water containing various concentrations of HX. After 6 hrs, they were cultivated in Petri dishes at 25°C. The background spontaneous mutation amounted to  $0.91 \pm 0.32\%$ ; exposure to gamma rays increased it to  $14.75 \pm 0.32\%$ . Treatment of these seeds with aqueous HX at a dose of  $10^{-5}$  to  $10^{-7}$  M reduced chromosomal aberrations and reinstituted cellular division. References: 6 Russian.

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CSO: 1840/828

UDC 636.2:616.-022.1

IMMUNIZATION AGAINST BLOOD PARASITES IN CATTLE

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 6, Jun 86  
(manuscript 4 Dec 85) pp 74-77

[Article by N.I. Stepanova, V.T. Zablotskiy and Z.P. Mutuzkina, All-Union Scientific Research Institute of Experimental Veterinary Medicine imeni Ya.R. Kovalenko, Moscow]

[Abstract] A method has been developed for the in vitro culture of *Theileria annulata*, with the subsequent use of the attenuated schizonts for immunization of 7-month to 2-year-old cattle. Effective immunity persisted for at least the 3.5 year period of observation, with limited reactogenicity on immunization. Recent developments have seen the use of cryopreservation of the pathogen at  $-196^{\circ}\text{C}$  in a medium including 10% glycerol or diemthylsulfoxide and 90% bovine serum. Preliminary trials have shown that immunized cattle may be grazed on fields contaminated with *Theileria annulata*. References 5: 1 Russian, 4 Western.

12172/9835

CSO: 1840/1084

## CONFERENCES

### ALL-UNION SYMPOSIUM--BIOCHEMILUMINESCENCE IN MEDICINE AND AGRICULTURE

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 5, Sep-Oct 86 p 66

[Article by T.A. Babayev and Ye.Ye. Gussakovskiy]

[Abstract] The title symposium was held 23-25 Apr 86 in Tashkent. More than 100 reports were presented by scientists from throughout the Soviet Union. Intense research on biochemiluminescence has resulted in the creation of dozens of new methods of diagnosis and prognosis in medicine and veterinary science. The symposium included 9 sections: Theoretical problems and mechanisms of luminescence in living organisms; techniques for measurement and methods of studying biochemiluminescence; photoluminescence; induced blood biochemiluminescence; application of biochemiluminescence in medicine and veterinary science; biochemiluminescence of cells, intracellular organelles and membranes; bioluminescence; biochemiluminescence of plants; and mechanochemiluminescence, thermoluminescence and chemiluminescence. Need was stressed for further theoretical studies of the phenomenon of chemiluminescence, with the development and use of chemiluminescent methods for prediction, diagnosis and nondestructive testing in various branches of medicine, biology, veterinary science, agriculture and biotechnology.

6508/9835  
CSO: 1840/681

UDC 008 + (-62)

ACCELERATED DEVELOPMENT OF SCIENTIFIC-TECHNICAL PROGRESS IN AGRICULTURE OF  
CMEA MEMBER COUNTRIES

Moscow VESTNIK SELSKOKHOZYAYSTVENNOY NAUKI in Russian No 6, Jun 86  
(manuscript received 5 Mar 86) pp 13-20

[Article by S. Dimov, Division Chief of Agricultural Secretariat CMEA]

[Abstract] The principal task of the Council of Mutual Economic Assistance (CMEA) member countries is to develop agro-industrial programs to be able to supply their citizens with consumer goods. Agricultural in these countries continues to develop at a rapid pace. In comparison to 1951, the volume increased 2.6 fold. Production during the 81-84 period was higher than that during the 76-80 years by 5.2-5.6%. The progress made could not be achieved without science and the Permanent Commission for Agriculture organized in 1956. In 1971 a program was conceived for further improvements in agriculture and integration of all CMEA members in these operations: breeding of new grain cultures, chemization, computerization, genetic studies, mechanization and electrification etc. Animal breeding was improved including artificial insemination and transplantation of zygotes. Genetic banks were established and veterinary medicine provided new drugs to control many diseases. Considerable progress was made in the area of animal feed. Genetic engineering methodology was introduced to improve various crops. Results of joint research showed the increasing role of multilateral cooperation in improving the efficiency of agricultural productivity. Figures 2.

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SOCIO-PSYCHOLOGICAL RELATIONSHIP OF MECHANICS TO COLLECTIVE UNDERTAKING

Moscow VESTNIK SELSKOKHOZYAYSTVENNOY NAUKI in Russian No 6, Jun 86  
(manuscript received 30 Jul 85) pp 34-41

[Article by A.F. Vedlya, Latvian Order of the Labor Red Banner Agricultural Academy]

[Abstract] Human factor is the most important aspect in the overall approach to improvement of productivity, the new advances in technology notwithstanding. Labor organization plays an important role in full realization of the potential of the workforce. Collective undertakings are rather a novel phenomenon in Latvia. A survey was carried out on a representative sample of Latvian mechanics concerning their attitudes towards job performance, organization of work, initiative, job satisfaction, etc. In this paper results of this survey are reported. About 65% of those interviewed were not satisfied with the organization of labor and remuneration. They did not like daily assignments, tended to favor long term commitments and activities in small groups. It appeared that with higher education, social aspects entered into the equation of job satisfaction. Another interesting conclusion: not all job satisfaction is a motivating force and conversely, dissatisfaction is not necessarily negative. This appeared to be a personal conclusion of the author rather than one based on the questionnaire. References 5: 4 Russian, 1 Western.

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CSO; 1840/1081

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